# PETROLEUM WEEK

JULY 13, 1956

■ A McGRAW-HILL PUBLICATION

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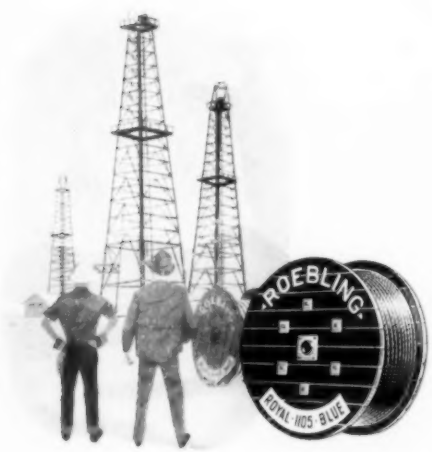


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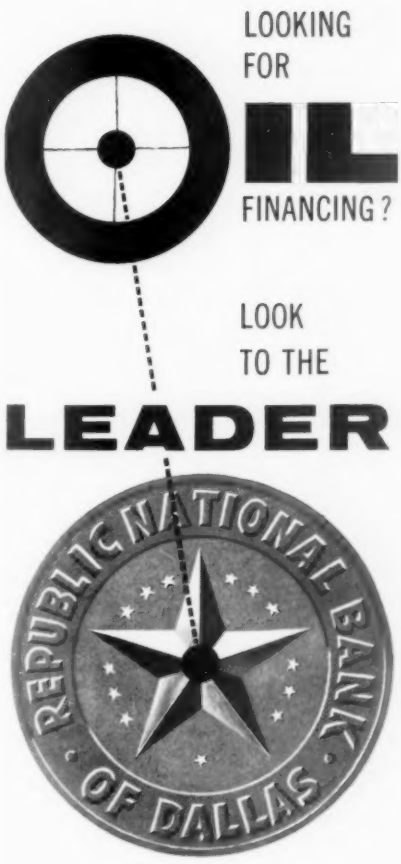
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# 60-Second Summary / WHAT'S HAPPENING IN OIL

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July 13, 1956

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This page will be perforated from now on so that you can tear it out and file it if you wish.

**There isn't going to be any quick settlement of the offshore dispute.** The big hitch: U. S. officials want to resume leasing in the disputed zone, while Louisiana officials only want to lift the ban against new drilling starts in areas already leased—with no new leases. The federal government's view is outlined in a plan drafted this week for Louisiana's consideration. . . . p. 11

•

**The steel strike hasn't crippled oil operations yet, but the big impact is coming.** Each strike day intensifies the scramble for tubular goods and other oil steel supplies. Even when the strike ends, there'll be months and months of just playing catch-up. . . . p. 9

•

**The strike also complicates the over-all petroleum supply-demand outlook,** particularly for the third quarter, by creating a drop in fuel oil demand. This will cause trouble even if there is a big after-strike surge in the fourth quarter or later. . . . p. 44

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**The goal of recovering all, not just part, of the oil from a reservoir may be near realization.** Humble Oil & Refining Co. is ready to put to use a new technique, injection of enriched condensing gas, in a couple of Texas oil fields. . . . p. 14

•

**There is a growing danger in the decline of wildcat successes and in rising exploration costs.** This is emphasized in a study done especially for Petroleum Week by Dallas oil economist H. J. Struth. His recommendations: Keep percentage depletion, raise crude prices, avoid government controls. . . . p. 25

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**Canada is about ready to give U. S. firms some sharp competition in petrochemical markets.** Canadian companies are preparing a new round of expansion now that natural gas and LPG pipelines are to be built. . . . p. 34

•

**Proponents of the bill (S-11) to eliminate "good faith" as a defense against price discrimination charges are still active.** At midweek, they were trying to clear the measure to the Senate floor. However, the bill is beginning to lose some of its original supporters. . . . p. 41

•

**Competition for new oil concessions in Venezuela is hot.** It was further stimulated when the government called for bids on six more lots in Lake Maracaibo. . . . p. 21

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**Another effort is being made to require the use of grain alcohol in motor gasoline.** The aim of a new bill in Congress is to reduce the farm grain surplus. It has little chance now, but may be pushed in 1957.

# Looking Ahead in Washington

McGraw-Hill
Washington
Bureau
July 13, 1956

**Senate lobby investigators are going beyond the gas bill fight.** About a dozen oil and gas companies have been selected for a study by the special Senate committee. The probe will include efforts made in behalf of natural gas legislation, but also will extend to the firms' other lobbying activities. Hearings will be held by early fall.

•

**The Pentagon is taking a new look at long-term fuel supply contracts.** The Armed Services Petroleum Purchasing Agency now buys products mostly on six-months contracts. There's some feeling in ASPPA that a switch to longer contracts—up to five years—would nail down supplies and perhaps cut costs. Critics dispute this view, pointing out that oil companies would be reluctant to sign such contracts. The issue may come to a head when the "single manager" system goes into effect later this year.

•

**It's official: The excise tax bill is dead until next year.** A House Ways & Means Subcommittee had recommended that a tax refund be granted on gasoline and other products destroyed by fire or other natural disasters. The group also would have lifted the excise tax on oil moved by pipeline when the movement is connected with operation of a refinery, bulk plant, or gasoline plant. But these proposals were wrapped up in an omnibus bill that House leaders now concede won't reach the floor this year.

•

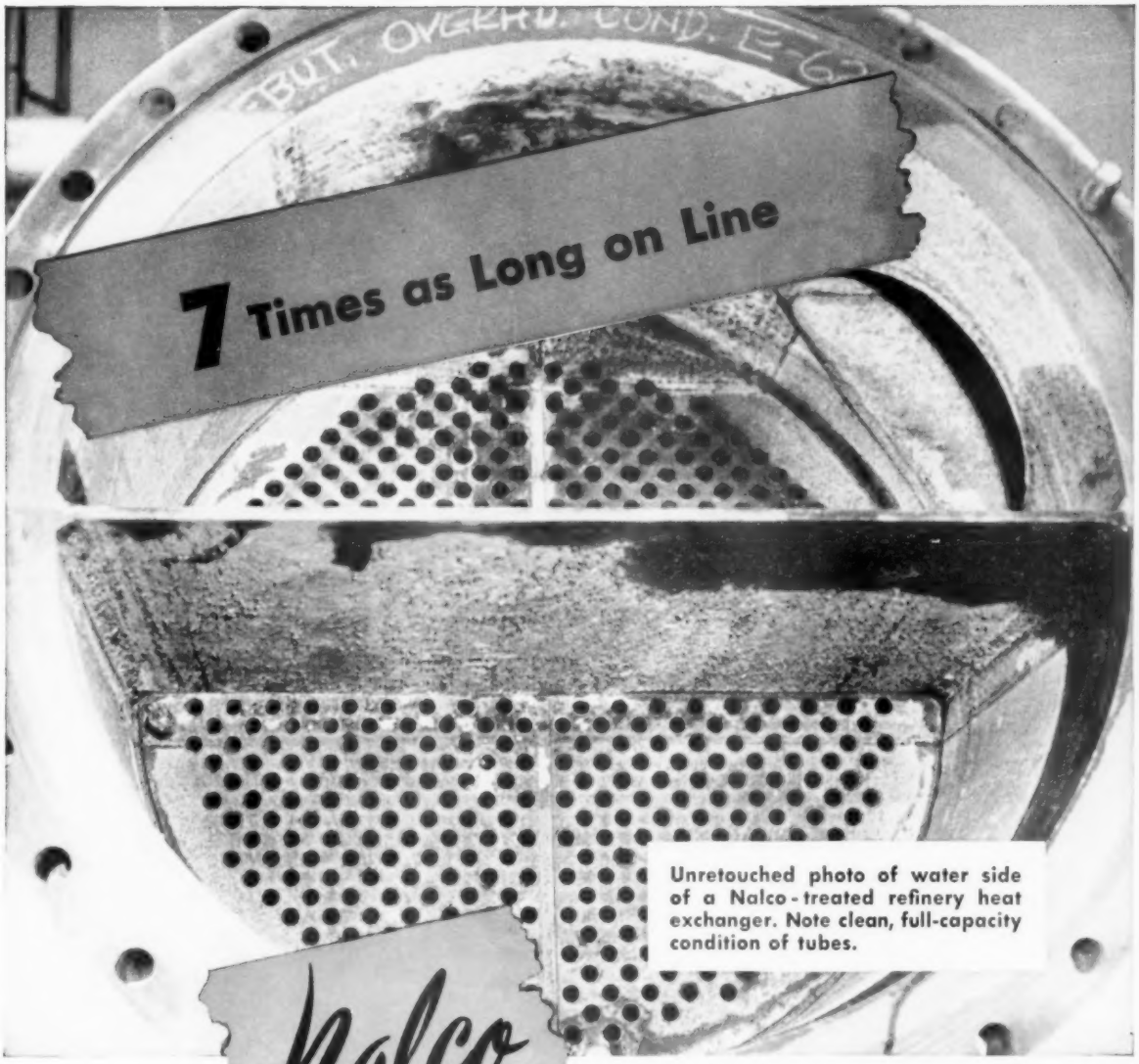
**FPC is going back to a neutral stand on use of gas under boilers.** That's the meaning of the Federal Power Commission's latest decision in the so-called "Black Dog" case. FPC originally refused to let Northern Natural Gas Co. sell gas to a power station in an area where coal is plentiful. The commission has now reversed itself—reportedly because it feared it had gone too far toward adopting the coal viewpoint that gas should be reserved for "superior uses." However, it is clear that FPC will still require ample supplies and adequate prices for "boiler" sales.

•

**The Canadian border is fading as an obstacle to natural gas movements.** FPC, in approving greatly stepped-up sales by Panhandle Eastern Pipe Line Co. to Union Gas Co. of Canada, observed that exports to "our neighbor and ally" are consistent with "policies of cooperation and joint endeavor" between the two countries. The commission's language bulwarks speculation that U.S.-Canadian friendship will work in favor of Tennessee Gas Transmission Co.'s proposal to import Canadian gas into the Midwest.

•

**ODM won't hold another hearing on the Gulf-East Coast pipeline.** Defense Mobilizer Flemming is awaiting further data from the Office of Oil & Gas before making a final decision on whether the U.S. should back construction of proposed crude lines between the Gulf Coast and eastern refineries. The ODM staff and OOG already have recommended against federal help. Flemming says defense planning data backing up these recommendations are so secret that a public hearing is impractical.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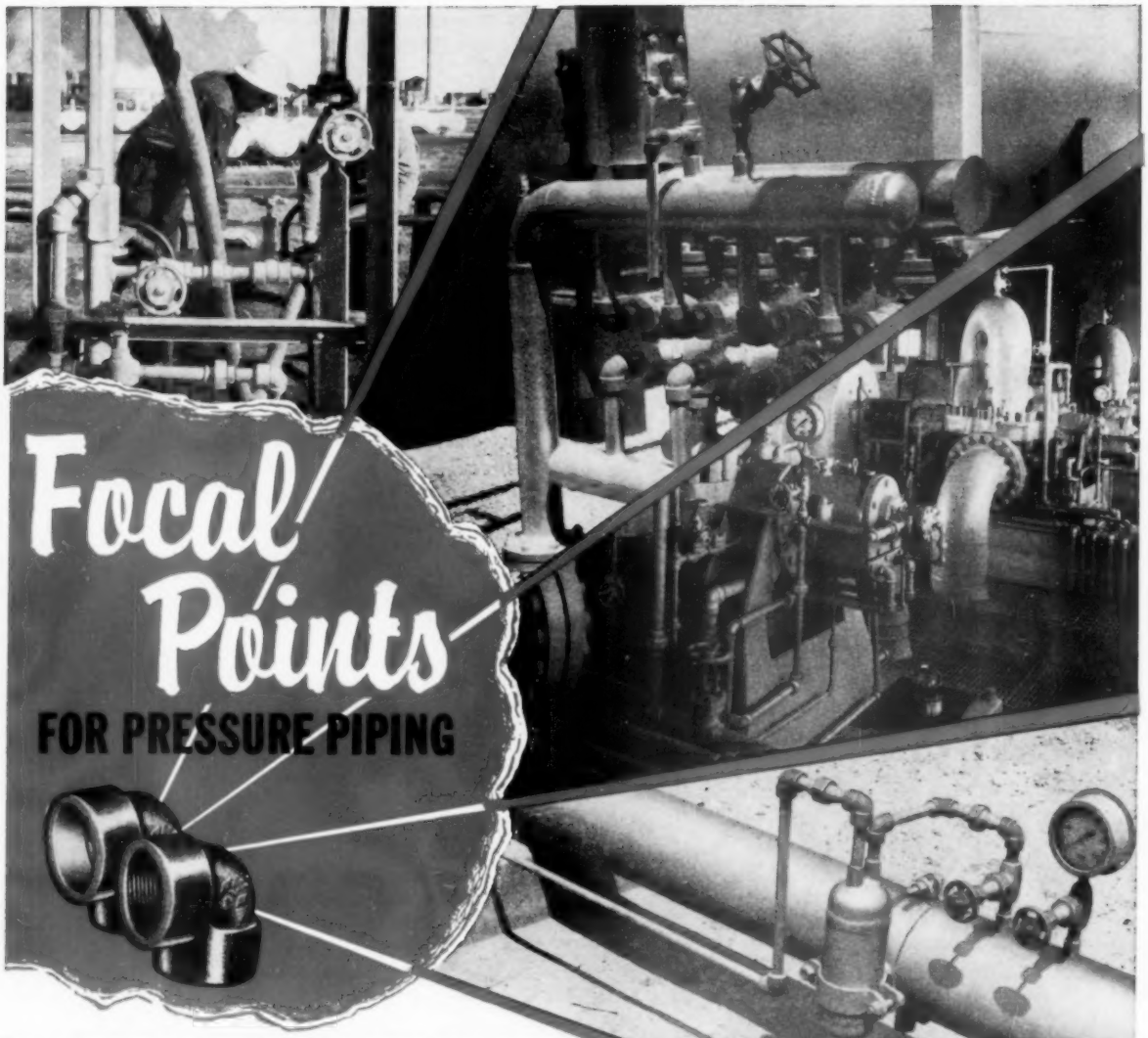


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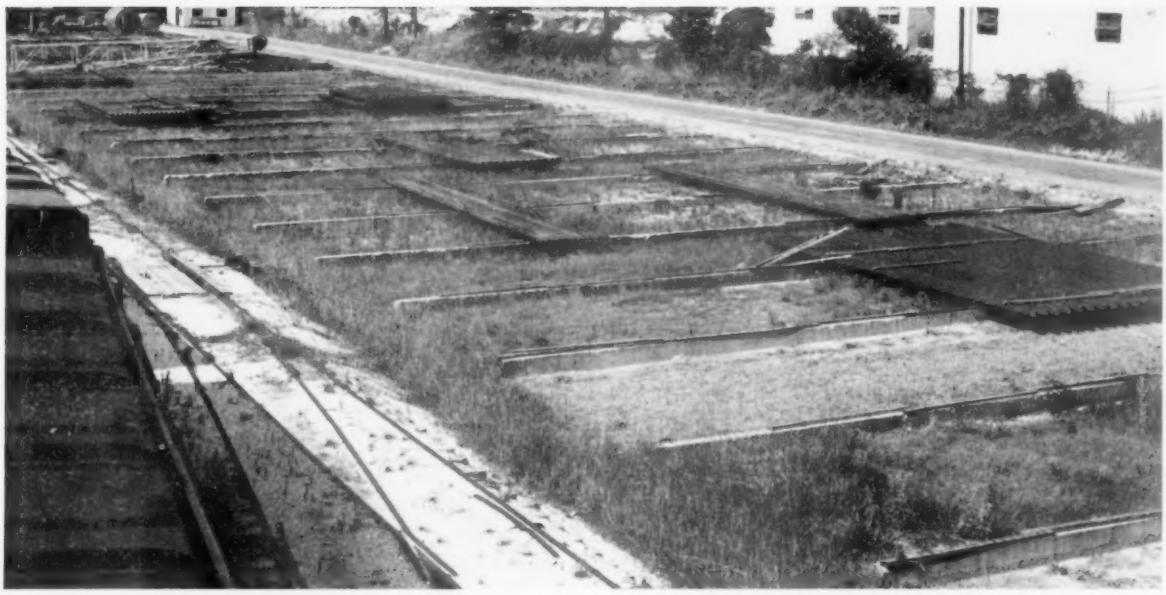


DWINDLING SUPPLIES OF PIPE at this Gulf Coast oil field supply house are evidence of how . . .

# Strike's Impact Gains Momentum

**The oil industry is beginning to hurt a little as a result of the steel strike. And it's going to start hurting a lot more unless the strike ends soon.**

That's the consensus of oil company supply firms, operators, and drilling contractors surveyed by PETROLEUM WEEK this week as the steel tieup approached its third week with no sign of a break.

A Gulf Coast supply firm official, waving a hand toward his nearly-empty racks, put it this way:

"No one has been hurt too bad yet. But if the strike lasts much longer —blooie!"

**Already, there are reports of some drilling plans canceled, of "bonus" payments for pipe, and of rocketing prices on the trickle of steel supplies from abroad.**

For example, Union Oil Co. of California is postponing all new starts for the duration of the strike.

"We were unable to build up any inventories of tubular goods this year," says a Union official. "Now we have just enough steel on hand to complete the wells we're drilling, and no more."

A Denver operator who planned to drill 22 wells during the last half of the year reports he has only enough pipe on hand for two wells. "Then we're through until pipe is back on the market," he says.

In California, some smaller operators are already paying bonuses for casing—when they can find any to buy. Highest of these bonuses to date has been 25¢ a ft. But operators can remember times during the war when it shot up to $1 a ft.

**For much of the industry, however, the big impact of the strike lies ahead.** Many have enough supplies on hand to keep operations going for two or three months or more. But they realize there'll eventually be a scramble for steel even if the strike should end now.

**A Southwest official of a steel firm emphasizes the point that there will be supply troubles even if the strike is a short one.**

"I checked with our main mill Saturday and they told me that if they started back to work at midnight it would take from one to three weeks to get back into full production of tubular goods," he says. "Last year we lost six weeks' production when our mills were struck for only 12 hours."

Another agrees: "It will take us a long time to get over the effects of this strike. And, of course, the longer the strike lasts, the harder it is going to be."

**The drilling end of the industry is feeling the strike's impact first. But refinery expansion programs and pipeline projects will be hurt, too, if the strike continues long.**

The tightest pinch is on casing. It was already in short supply before the strike, and the situation is worsening rapidly.

Jack Bates, Jr., vice-president of Reading & Bates Drilling Co., Tulsa, says his firm is already finding it hard to get casing or pipe.

"Until recently, we were able to buy pipe and casing with a promise of paying it back out of our future deliveries from the mill," he says. "But now that the mills are shut down, we aren't able to make this kind of arrangement any more."

Bates thinks that a prolonged strike will be especially rough on offshore operators, because they use up to 500 tons of steel per well.

Ironically, the current Supreme Court ban on new drilling starts in the disputed Louisiana offshore area

(page 11) may free some drill pipe for use on land.

**In general, the immediate blow is falling on the smaller operators who don't have much inventory.**

The Texas Independent Producers & Royalty Owners Assn. is currently making a check among independents to see how badly they are being hurt.

A. E. Herrmann, TIPRO president, says the organization plans to meet later this month to consider what can be done about the steel shortage.

"We think it possible that the worst effects can be alleviated if we can work out an improved allocation system," he says.

**Some small operators are facing lease obligations that must be met on schedule, and the steel shortage puts them in a bind.**

A Rocky Mountain operator's remark on this was typical: "Let this thing go for any length of time," he said, "and we'll have to start paying royalties to hold some leases."

**Many of the larger operators are in a better position to continue normal operations for awhile,** as this statement by an Oklahoma firm shows:

"We have a fair supply of tubular goods on hand or coming, sufficient to operate over the next quarter at our present rate of activity.

"But if the strike lasts as long as six weeks, we undoubtedly will have to revise our drilling program in order to stretch our stocks, and to provide a margin to cover obligation and protection wells."

**Some parts of the nation are feeling the strike impact more quickly than others. California, for example, appears harder hit than the Gulf Coast.**

• A Bakersfield contractor who operates six rigs reported two contract cancelations within 48 hours. "If the strike lasts another week, it will knock our business 50%," he said near the end of last week.

• Another, who operates nine rigs in the San Joaquin Valley and the Los Angeles Basin said: "We're getting ready to batten down the hatches. If they let the strike go 30 days, we will have all of our rigs in the yard." He reported one cancelation, and said one of his rigs had to wait a day and a half on location while the operator rounded up casing.

**Rock Mountain operators, having just finished their best half year in history, fear the strike is going to slow them down in the second half of the year.**

One reason they're having supply troubles is that the stepped-up tempo of drilling has eaten up steel as soon as it hit Rocky Mountain yards.

"We're already screaming for pipe," says one major company official. This company has discoveries to offset and leases to validate, and has committed inventory in sight to these purposes.

One company with extensive leases in the Denver Julesburg Basin of Colorado says it can already tell the difference in farmouts and interest deals.

An independent who had a recent discovery in western Nebraska says he cannot start further drilling there until pipe is in sight for completion.

**In Louisiana, the strike is causing more worry than the Supreme Court's current ban on new offshore drilling starts.**

The companies figure the latter problem is apt to be solved before the effects of the steel strike are gone.

At the moment, however, Louisiana operators appear to be getting by on supplies. One contractor says he can go for four or five months without suffering much. And a big supplier reports it will be a month before he feels the real effect.

**The situation is touch-and-go in Texas,** although many believe the strike will have to run 30 to 60 days before it will do serious harm.

As in other areas, the principal shortages are in casing, tubing, and drill pipe.

**The general steel supply is bound to get tighter as a result of the government's new "set-aside" order to steel mills that are still operating.**

Such mills are required to reserve a larger proportion of their output for defense purposes. While the amount varies from mill to mill, the average increase in steel earmarked for defense is 200%.

This order is on top of the one previously issued, requiring steel warehouses to hold certain types of steel for filling defense orders.

# Gas Producers Lose a Round

**Efforts of ten natural gas producers to trim the jurisdictional powers of the Federal Power Commission have been blocked—at least temporarily—by a federal circuit court decision.**

The U.S. Fifth Circuit Court of Appeals, at New Orleans, last week dismissed complaints filed by the producers against the commission's issuance of the Series 174 orders.

Order 174 was issued by FPC a month after the U.S. Supreme Court's Phillips case decision of June 7, 1954.

The order froze producer gas prices, as of that date, even in cases where contracts already had been signed calling for higher prices. It also required producers to obtain certificates of convenience and necessity.

**The independent producers tried to convince the court that they were not natural gas companies and therefore not subject to FPC rules and regulations.**

The ten producers asked the appeals court to overturn the commission action on the ground that it deprived them of property rights, in violation of the "due process" clause of the Fifth Amendment.

The complaining producers fall into three categories:

• Those who objected to that portion of the FPC order which prohibited them from abandoning service without permission from the commission.

• Those who claimed they should not be subject to the order anyway because they produce and transport gas only from the wellhead to a central point in the same field, not in interstate commerce for resale to ultimate public consumers.

• Those who claimed FPC erred in suspending rate increases provided for in contracts signed before the Phillips decision.

**But the court ruled that at this stage it has no jurisdiction.**

In a two-to-one decision, it held that the FPC order was "not definitive . . . The administrative process has not been completed."

This means, in effect, that court action cannot properly be sought until FPC has made specific application of its general order (174-A) and rejected petitions for modification or exemption.

But the court did not answer the more basic question: Were the 174 orders a valid interpretation of the Phillips decision?

**Attorneys for the producers say the decisions, though disappointing, do not end the hope the courts eventually will find that FPC overstepped its bounds.**

There also is some talk that the case will be carried on to the Supreme Court.

In the meantime, the producers remain subject to FPC regulations—as before.

# Offshore Compromise Bogs Down

**Hopes for a quick offshore compromise are fading. The U. S. wants leasing rights, but Louisiana won't agree to that. So the situation stays snarled.**

**Efforts of U. S. and Louisiana officials to reach a working agreement in the offshore dispute have turned sour.**

A Louisiana delegation returned home from Washington last week in an unhappy frame of mind, blaming federal officials for the failure to end the stalemate that has stalled most offshore activity.

**The Louisiana group says the federal government won't agree to permit new drilling unless it can go ahead with new offshore leasing in the disputed area.**

The state-federal meeting resulted from a ruling by the U. S. Supreme Court that no new drilling or leasing in the disputed zone could begin—except by agreement between the two parties—until the boundary case now before the court is settled next fall.

Following the court's ruling, the state legislature rushed through a law which would permit it to put offshore funds in escrow.

This was to have cleared the way for a state-federal agreement to permit continued drilling operations until the boundary case is finally settled.

However, last week's meeting in Washington failed to produce results. Instead, it may have added more fuel to the fire.

**Federal officials insist they haven't issued any "ultimatum" to the state demanding the right to make new leases.**

However, they do not deny that they are pressing for the leasing right.

"Both sides made their views known last week," says an Interior Dept. attorney, "but nothing hard or fast was decided upon."

**The Interior Dept. is now drafting proposals which it will submit to the state as a basis for further negotiations.**

There is general speculation in Washington that Atty. Gen. Herbert Brownell will not approve any agreement that does not permit new federal leasing.

If so, the second round of conferences isn't apt to be any more productive than the first, because Louisiana doesn't want to yield on this point.

"To do so," says Louisiana Atty. Gen. Jack Germillion, "would have the effect of lifting an injunction which the state went to the court to get in the first place."

**There are other obstacles which may add to the delay in arriving at a settlement.** Some of these cropped up at the meeting last week in Washington, and no solution was reached.

**One is the disagreement over the extent of the disputed area.** At this point, no one knows exactly which areas are in the "twilight" zone.

**Another problem is how to protect the interests of both the state and the U. S. if drilling is renewed.** The suggestion has been made that each party would maintain an escrow fund of its own so that money could be returned by the one that loses the Supreme Court's eventual ruling.

**There is also the question as to who would supervise operations in various parts of the disputed zone.**

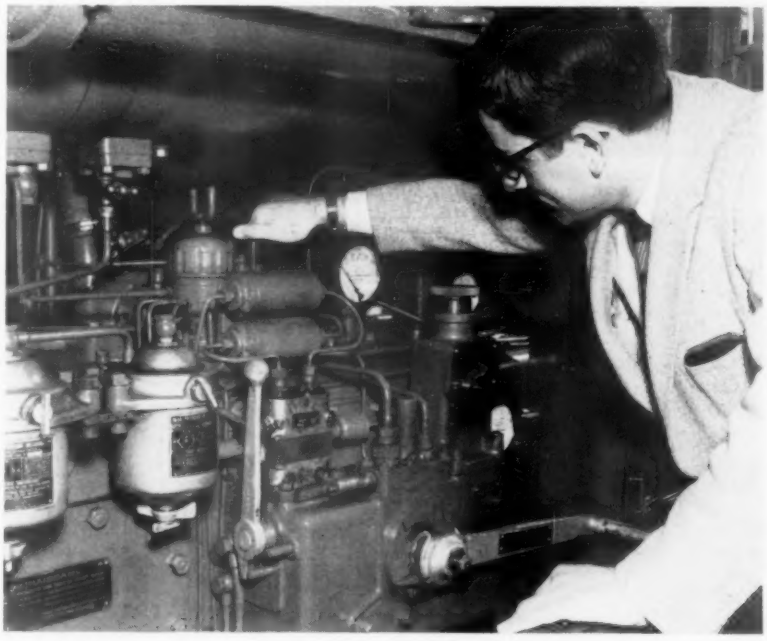
Each side had previously taken the stand that it had a legal right to control the area falling within its claim. Since their claims overlap, it would be necessary to determine which would have authority to act.

**The federal government may play a waiting game in order to put pressure on the state.**

Here's why: Louisiana, in seeking the injunction to block federal leases, hadn't anticipated that the court would ban all new drilling starts, too. That development complicated matters, for it had the effect of "freezing" a major portion of offshore work.

The disruption has caused the companies a great deal of inconvenience, and has caused many workers to be laid off. This has added to the pressure on the state to act quickly.

**The showdown will come when the U. S. presents its proposals to the state, perhaps within two weeks.** Unless the differences are ironed out at that time, the stalemate is apt to continue until the Supreme Court—or possibly Congress—acts to settle the issue.



## Texas Studies Free-Piston Engine

**Test engineer Peter Kalil sets controls to start the free-piston engine now being studied at The Texas Co.'s main research center, Beacon, N. Y. A starting push normally is given by compressed air in an accumulator tank filled during a previous run of the engine. The studies are being made to determine the engine's fuel and lubricant needs to set up standards for possible future use.**

# What's New / IN THE INDUSTRY

## Big Plans for Rifle?

**The Navy apparently has hopes for selling Congress on an ambitious program at the Rifle (Colo.) oil shale plant.**

The plant was turned over to the Navy recently by the Interior Dept.'s Bureau of Mines, which has operated the facility since World War II. When the bureau was unable to get sufficient funds from Congress, the plant at Rifle was put on a standby basis.

Cmdr. Emory C. Smith, deputy director of naval petroleum and oil shale reserves, says the plant is likely to remain on standby basis until next June 30, at least. In the next few months, Smith adds, the Navy will draw up plans—to submit to Congress next term—on what it thinks should be done with the plant.

In the meantime, he says, 40 employees of the Bureau of Mines will remain at the plant in the coming months "for housekeeping operations."

•

## Gulf Hits Oklahoma Order

**Gulf Oil Corp. has turned to a three-judge federal court in its challenge of the Oklahoma Corporation Commission's authority over crude oil purchasers.**

The commission has threatened to cite for contempt any company that installs purchaser-proration without first obtaining permission from the regulatory body (PW—Jul.6'56,p17).

Despite the warning, Gulf invoked purchaser-proration on July 1. Since then it has been buying only 75% of the amount of crude it purchased daily in May. This trimmed about 5,000 b/d from Gulf's crude oil purchases.

Gulf then went to a federal court judge in a bid to get a writ restraining the commission from carrying out the order. The petition was turned down on the ground that Gulf had not exhausted all remedial steps in the commission and state courts. Now Gulf is trying again—this time before a three-judge panel.

•

## More Asphalt for Roads

**Yearly demand for asphalt used in road building is expected to increase by at least 40% in the next four years** because of the new federal highway program.

It's estimated that use of asphalt for new road construction will jump 21% over present figures next year. And demand will step up ever faster if state and local governments continue their accelerating rate of highway construction.

Asphalt will be used on both urban and rural portions of the federal-aid system. The major demand will come from the big rural mileage.

The estimated annual market, in tons, for asphalt to be used in highway construction:

| | |
|---|---|
| 1956 | 7,000,000 |
| 1957 | 8,500,000 |
| 1958 | 9,200,000 |
| 1959 | 9,600,000 |
| 1960 | 9,800,000 |

o

**Top government defense officials maintain that a proposed new pipeline to the West Coast is not needed for national defense.**

The officials—including Defense Mobilizer Arthur Flemming—gave their views in hearings last week before the House Armed Services Subcommittee.

The subcommittee resumed hearings on the question of a pipeline from Texas to California following growing concern over crude oil availability on the West Coast.

Flemming told the group that "nothing has transpired during the past year to change our view that the West Coast pipeline . . . is not essential to meet wartime requirements."

He added that he did not believe the Office of Defense Mobilization would be justified in authorizing use of government funds to finance the project—sought by West Coast Pipe Line Co.

o

**Petroleum industry capital expenditures throughout the free world reached a new high of $8.2-billion in 1955,** according to the annual financial analysis of the industry published by the Chase Manhattan Bank. This compares with capital outlays of $7.7-billion in 1954.

The gross fixed assets of the oil industry in the free world amounted to $63-billion at the end of 1955, up from $57.8-billion a year earlier.

Capital expenditures of the oil industry in the U. S. last year were $5.6-billion, according to Frederick G. Coqueron, the bank's petroleum analyst. Of this total, capital expenditures for exploration, drilling, and production (including the cost of dry holes) accounted for $4.1-billion, or 73.2%. This ratio compares with the average of 69.8% recorded for the 1946-55 period.

According to the annual McGraw-Hill capital spending survey, oil's capital outlays in the U. S. totaled $5-billion in 1955 and are estimated at $5.5-billion this year (PW—May 18'56,p9).

•

**A proposed $20-million oil center in New Orleans moved another step nearer final approval last week.**

The City Affairs Committee of the state House of Representatives approved a bill permitting certain property tax exemptions. The state Senate already has O.K.'d the bill. If it passes the House, it will go before the voters in the November general elections as a constitutional amendment.

•

**Schlumberger Well Surveying Corp. has conducted its "millionth" operation**—an electric log of a Humble well in Danbury field, Brazoria County, Tex., last week.

Schlumberger's first electric log run in the U. S. was on a Shell well in California in 1929.

•

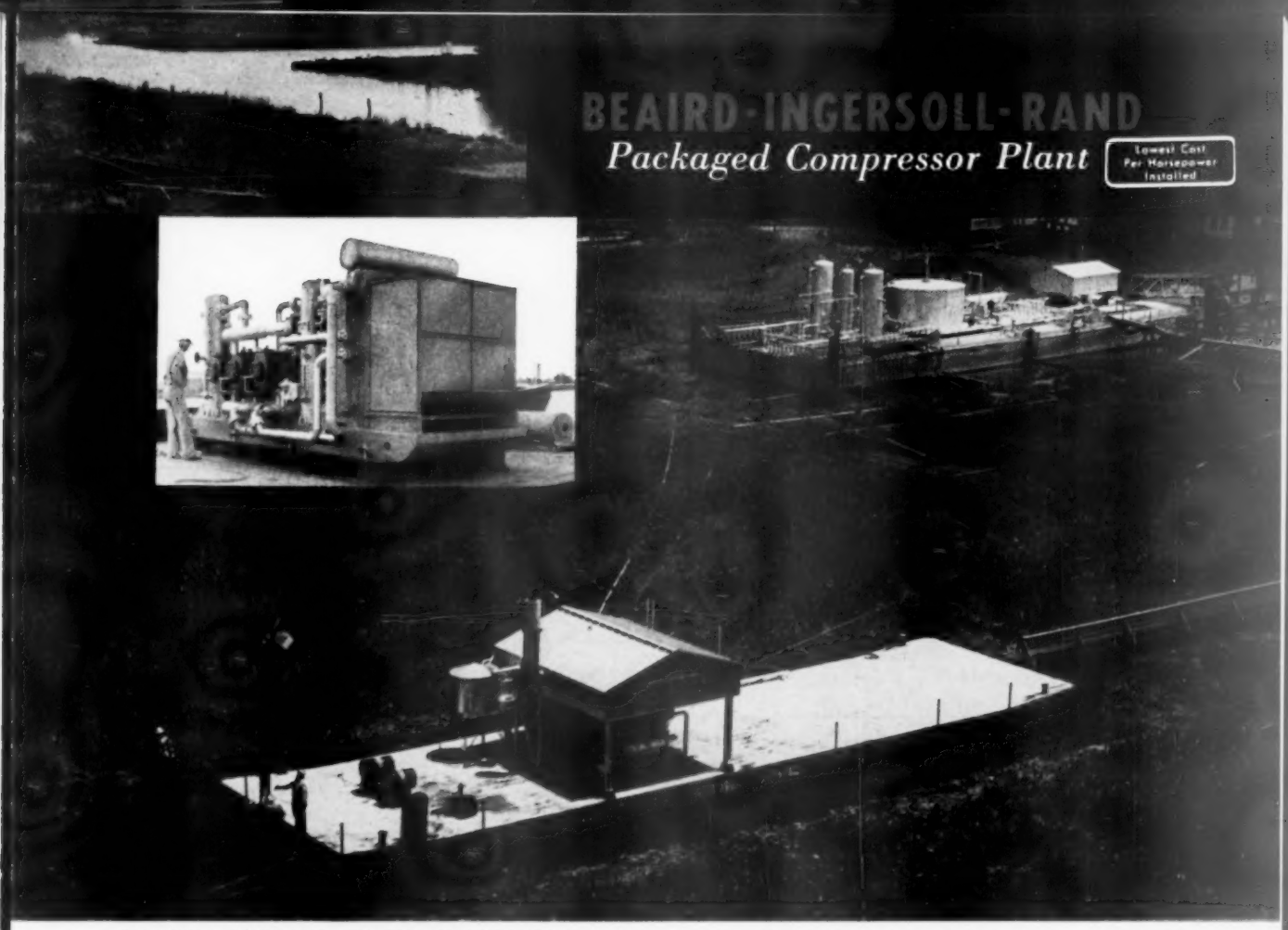
**Britamoil Pipe Line Co. Ltd. is the new name of Canadian Gulf Pipe Line Co., recently purchased by British American Oil Co.**

•

**El Paso Natural Gas Co. will begin construction immediately on a natural gasoline plant and other facilities in West Texas** as another step in its projected $84½-million expansion program.

The proposed construction will include 65 mi. of gathering lines and a compressor station. The gathering facilities will include a 16-mi. 20-in. line extending from a proposed Andrews County compressor station to El Paso's existing plants located at Goldsmith.

The natural gasoline plant will have a capacity of 20-million cu. ft. per day. It will gather gas now being flared in the Northeast Midland Farms, South Andrews, West Fuhrman Mascho, Block Nine, Emma, and Wemac fields.




GULF REFINING COMPANY BAYOU COUBA FIELD COMPRESSOR STATION—equipped with a Beaird-Ingersoll-Rand 165 h.p. 6 JVG four cycle gas engine driven compressor, Young radiator with lubricating oil cooler and gas coolers, and all necessary controls for unattended operation. Other sizes 110 to 660 h.p.

*Packaged Compressor for —*

**BARGE MOUNTED GAS LIFT SERVICE**

Gulf Refining Company has installed this barge mounted compressor station in Bayou Couba Field, Louisiana. Part of a 21-well gas lift operation, the 165 h.p. 6 JVG Beaird-Ingersoll-Rand packaged unit was added to supplement three high gas-oil ratio wells formerly used to produce the field. Picking up from the lifted wells at 50 psig., the compressor boosts the gas into the injection system at 825 psig. where it is joined with make-up gas drawn from the high ratio wells. By using a closed gas lift system Gulf has stopped flare gas losses and extended the life of the high gas-oil ratio wells.

Completely packaged and on its own skid base, the unit was installed on a conventional cargo barge. Piping and plant layout has been designed to facilitate the economical addition of a second compressor to the station when required.

Fully automatic in operation, the compressor is equipped with speed and pressure regulators which permit it to swing with changes in line pressure by varying the engine speed through a range of 50% to 100%. Other controls watch over the unit day and night ready to shut it down should any unusual operating condition occur. Only routine scheduled inspection and maintenance is required for 24-hour unattended operation.

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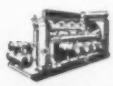
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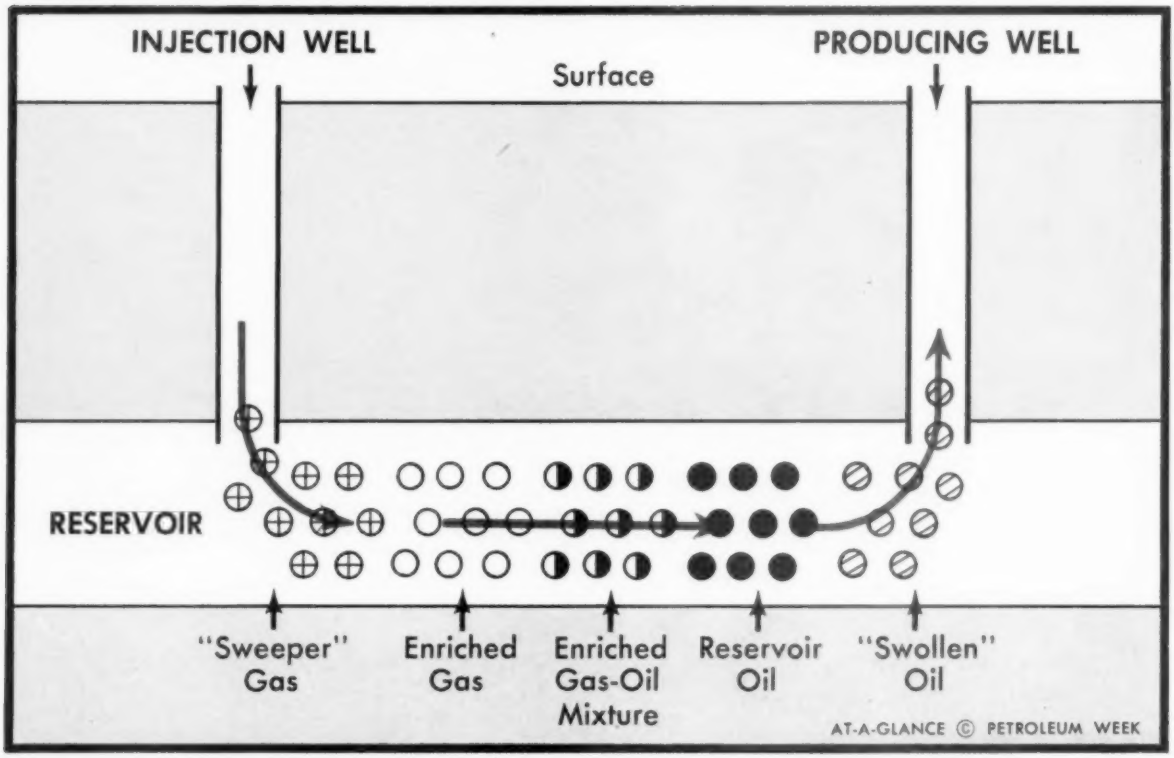



CONDENSING GAS' ability to sweep all crude from a reservoir may soon be tested as . . .

# Humble Tries New Recovery Method

**Humble Oil & Refining Co. is ready to inject enriched "condensing" gas to get more oil from two Texas fields. If successful, this brand-new technique could represent a giant stride toward the goal of recovering all, not just part, of the oil from a reservoir.**

Humble isn't the only company actively engaged in perfecting the new method.

Stanolind Oil & Gas Co. has satisfactorily field-tested a similar process.

Atlantic Refining Co. is on the verge of a field test. Carter Oil Co., Sun Oil Co., and probably others are pushing their research efforts along this line. At least two, and possibly three, papers on the process are scheduled for the fall meeting of the American Institute of Mining, Metallurgical & Petroleum Engineers, Petroleum Branch.

It's part and parcel of the industry's stepped up drive to solve one of its most vexing problems—too much oil left in "depleted" fields (PW—Jul.6'56,p14).

**Humble last week asked the Texas Railroad Commission for permission to start programs in the Bronte field, Coke County, and one reservoir of the Seeligson field, Jim Wells and Kleberg counties.**

In fact many of the reservoirs of the Seeligson field are now a candidate for the treatment.

The Humble request poses something of a question for the operators forming a pressure-maintenance unit for the remainder of the Seeligson pool. Present plans call for a gas injection-waterflood "squeeze" on the complex zones and reservoirs of the field in which Humble was to cooperate (PW—Jun.1'56,p14). Using two different types of programs might cause problems.

The unit operators are now running laboratory tests to assess the feasibility of switching to the enriched-gas method.

Humble's application for Seeligson is scheduled for a hearing later this month.

**The theory behind the new technique is that the enriched gas—containing such lighter ends as ethane, propane and butane—will dissolve in the oil and thus bring a greater amount of it to the surface.**

In a paper presented to the AIME last fall, H. L. Stone and J. S. Crump, of Humble, concluded that "a condensing gas drive results in extremely high oil recovery, approaching 100% under the most favorable circumstances."

**Gas cycling, of course, has been used for years. One major drawback seems to be that, while dry gas recovers lighter components, it severely shrinks the residual oil and leads to clogged reservoirs.**

The idea behind gas cycling is that the injected gas vaporizes the oil and "sweeps" it to the producing well. What happens is that the lighter ends are vaporized, but much heavy residual oil is left behind.

**Enriched gas, however, apparently swells the oil instead of shrinking it, and prevents clogging.**

Stone and Crump pointed out that the results of their experiments showed that "the condensing components swell the residual oil, or minimize

shrinkage, and therefore maintain the relative permeability to oil at value higher than it would have been in the absence of such condensation.

"This will result in efficient physical displacement of the oil originally in place. Vaporization of any stock-tank oil will benefit oil recovery because the vaporized oil flows toward the producing wells more rapidly than it would have had it remained in the liquid phase."

Using a horizontal, sand-packed steel tube as the reservoir and a variety of gas and gas mixtures, Stone and Crump obtained the following results:

- A gas in equilibrium with the reservoir oil caused no "swelling" of the oil while soluble gas and gas mixtures ranged up to 43.6% swelling for propane-rich gas.
- Salt water produced an ultimate 67% of the oil in place.
- Equilibrium gas produced 41% of the oil.
- Separator gas (high-pressure condensate gas) yielded a 67% recovery.
- Condensate gas (naturally occurring reservoir fluid) achieved an 83% recovery.
- Composite gas (mixture of condensate and casinghead gas) reached a 94% recovery rate.
- Propane-rich gas attained a 98% mark.
- An ethane-rich gas was "extremely efficient" and recovered "essentially all of the oil" with a relatively small injection.

A light crude with a stock-tank gravity of 47.5 degrees was used for this experiment.

Another series of tests were run with a heavy, asphaltic crude of 18.9 gravity, and substantially increased recoveries were also noted.

**Variations in the methods of using the lighter gases includes one under study by Atlantic Refining Co.**

It's aimed at a distinct separation between the gas-oil mixture and a following "sweeping" gas (diagram, page 14).

In this technique, a gas soluble with the oil, such as propane, is used to build up the "miscible" front.

Another component, such as natural gas, is injected later. Its role is to pick up any residual liquid left by the propane-rich gas—rather like a broom sweeping up leftovers.

This lean gas is soluble with the preceding propane "slug." Therefore, it sweeps off the remaining propane and liquid mixture—and also insures full recovery of the propane.

But between these two components is another "slug" of propane-rich gas which acts as a sort of bumper between the two to keep them apart.

This second slug of propane is carefully calculated so that there will always be a small amount of it between the oil-propane mixture and the natural gas.

The ultimate objective is to clean out a reservoir completely with one extended-period cycling operation. It is thought there would be no need for a recycling program.

(Stone and Crump noted that a condensing gas drive might leave "appreciable liquid saturation in the reservoir," which might require subsequent vaporization with a suitable type of gas).

**Despite its promise, there are some reservations at this point about the feasibility of the method. The price of the enriched gas, some feel, could rule it out.**

A reservoir engineer familiar with the work being done points out that propane equivalent to a bbl. of crude costs about $1.60. He and others think this might make the process too expensive.

The propane would be recovered. But it would have to be reprocessed in a gas plant to extract it from the mixture produced in the operation. Therefore, it is reasoned, the value of the recovered propane would amount to perhaps as little as 50¢ per bbl. equivalent when the reprocessing costs are taken into account.

Right now, they say, propane is in abundance. But the market might not remain that way. Eventually, a company utilizing the process might find it is costing too much in relative values.

**Humble's Seeligson and Bronte programs are similar, except that Bronte gas now being flared will be utilized, while at Seeligson the enrichment component will have to be purchased.**

The Seeligson component, propane, will be bought from a gas processing plant being operated by Magnolia Petroleum Co.

Eventually, Humble probably will build its own plant to extract propane and other elements.

Last week, the company laid out this proposed program for the Bronte field:

It will be an integrated operation, involving the five producing horizons of the unitized portion of the field: Palo Pinto, Capps, Goen, Gardner, and Cambrian. All produce oil except the Gardner, which yields gas.

The crude oil is very light and rich in intermediates. The gas now being flared, which approximates 700,000 cu. ft. daily, is sufficiently rich to be used for the "condensing" gas method of recovery, Humble believes.

Casinghead gas from the four oil-producing zones and natural gas from the other formation will be gathered and run through a compressor plant. It will then be injected into the Goen and Cambrian oil reservoirs.

This will change the present water drive mechanism in those two reservoirs to a full enriched, condensing gas drive.

To increase the amount of injection gas, oil from the Goen horizon will be heated to capture more of the lighter hydrocarbons.

**Humble's reasons for the proposed Bronte program are to increase the oil recovery and to provide a market for gas now being flared.**

The possibility of increased recovery was developed at the commission hearing, when R. C. Culver, Humble's senior engineer in the Wichita Falls district office, testified that:

(1) Ultimate oil recovery from the Goen and Cambrian formations will increase by approximately 50% over the natural water-drive rate with the use of the new technique.

(2) An additional 4.5-million bbl. of crude will be produced, with a value exceeding the cost of the operation.

(3) A center-to-end sweep pattern will be employed for the injection.

Culver and Humble attorney Charles Shaver pointed out that the products to be used in the program had a monetary sales value that would be deferred; therefore the program depends on an increase in allowables for unit. They said the condensate has a market value of about $2.90 per bbl., and the gas, about 10 cents per thousand cu. ft.

They requested that the Goen allowable be hiked to 2,000 b/d initially, increasing to 3,000 b/d as the program proceeds. With insufficient data available now, they asked that Cambrian allowable be retained at 82 b/d per well. There are four wells in the field. The Palo Pinto zone, with 49 completions and 47 producing wells, is making 876 b/d of crude for an accumulated production since August, 1948, of 2,965,000 bbl. Some 200,000 cu. ft. of casinghead gas is being flared daily.

The Capps horizon is a minor producer. The Goen, with 30 producing wells, has an allowable of 1,945 b/d and about 450,000 cu. ft. of gas is being flared daily. It has an accumulated production of 1,606,000 bbl.

There is 24,000 cu. ft. per day being placed from the Cambrian.

The Gardner has an irregular production history, with an accumulative total of 2.5-billion cu. ft. of gas and 69,000 bbl. of condensate.

# Where Will Paradox Basin Crude Go?

**Where to find a more direct market for their crude production is a big problem facing operators in the Paradox Basin.**

This has been becoming of increasing concern as development in the Aneth area of the basin, in southeastern San Juan County, Utah, moves forward. Shell Oil Co. and Superior Oil Co. are active in the area, along with The Texas Co., which drilled the discovery well.

Meanwhile, development of several other new fields in the area appears to be slowing as the study of a possible market progresses. Operators feel that there is no sense in developing the areas and increasing production as long as there is only a limited outlet for the crude.

The Paradox Basin, which extends into northern Arizona, southwestern Colorado and northwestern New Mexico, is "many miles from nowhere."

**Such crude as has been moving in recent months has been to the El Paso Natural Gas Co. refinery at Pruett, N. M.**

But here, the products from the crude have to compete ultimately for any sizable market with:

- West Texas production.
- The very sizable distillate output of the gas fields of the San Juan Basin.
- Products lines now serving Arizona and New Mexico from both Texas and California.

And while both Arizona and New Mexico have shown appreciable population increases in recent years, neither is considered a prime market area from the standpoint of quantity.

**The Texas Co. has arranged to move 2,000 b/d of Aneth field crude to Salt Lake City.**

This is an involved arrangement, which includes movement of the crude by both truck and tank car to the Utah Oil Refining Co. (Standard of Indiana) plant.

Crude will be trucked from the field to a railhead at Thompson, Utah, and shipped from there to Salt Lake City by rail. The over-all haul is approximately 300 mi.

Other refineries in the valley—Salt Lake Refining, Phillips Petroleum, and the independent Western States Refining—can all use more crude. But volume delivery would necessitate expansion of petroleum products systems emanating from the district.

Texaco now has four wells completed at Aneth, with more producers in sight, on the basis of drilling nearing completion. The discovery, producing from the Paradox (Pennsylvanian), was completed for 1,704 b/d of 43-gravity oil. Subsequent completions have been of similar caliber.

To date, the new field, which is on the northern portion of the Navajo Indian reservation, gives promise of being the "discovery of the year" in the Rocky Mountain region. It has already shown itself the most important oil discovery in the Paradox Basin up to this time.

Products from the crude processed at Salt Lake City will move through the Salt Lake Pipe Line Co. (Standard of California) into Idaho, Oregon, and Washington markets.

**But as to any more direct market, any consideration of pipeline construction will have to await very large additions to reserves.**

The reasons for this are the vast distances involved.

But there are those in the oil industry who now feel that, just as the Pacific Northwest will be served within a few months by natural gas from San Juan County, so eventually will the northwest receive petroleum products from crude produced there.

There's been considerable discussion in marketing circles of the products line, with the possibility that it might go directly to the San Francisco Bay area, serving major highways along the route in Nevada.

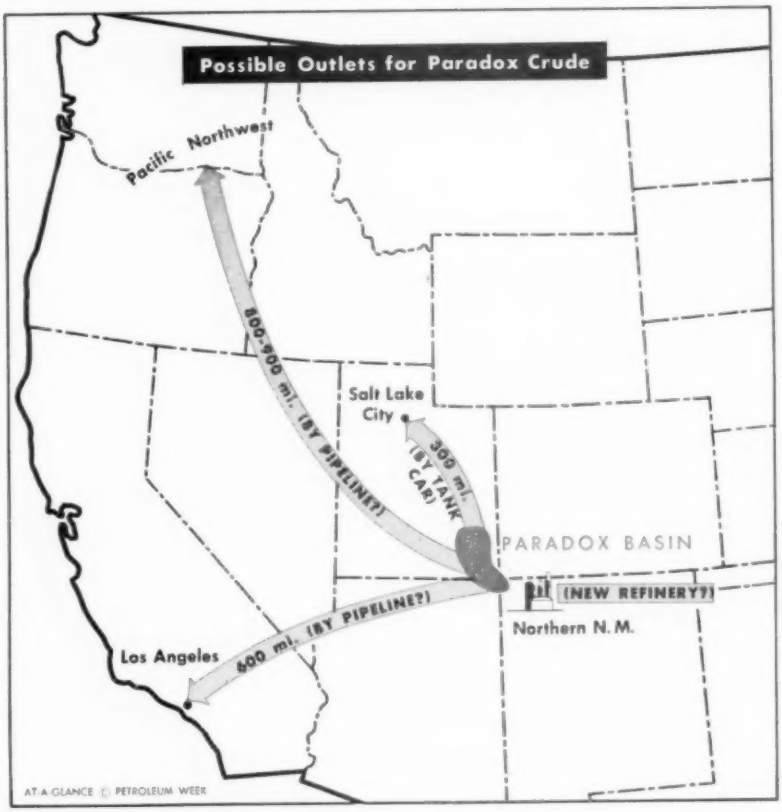
This would enable refiners to secure important diversification of shipments —either to the Pacific Northwest or to California.

Such a line would involve the laying of between 800 mi. and 900 mi. of pipe.

Those in the area feel this crude movement presents an alternate solution to the unhappy struggle over pushing West Texas and New Mexico crude into the Los Angeles marketing area.

A crude line from the Paradox to the Los Angeles Basin, a distance of some 600 mi., is also in the thinking stage. El Paso Natural Gas Co., which continually is enlarging its facilities to move West Texas and New Mexico gas to the Pacific Coast, now is considering a crude line (PW—Jul.6'56, p9).

The line would serve the San Juan Basin of New Mexico as well as the recent, important discoveries in the Paradox Basin.



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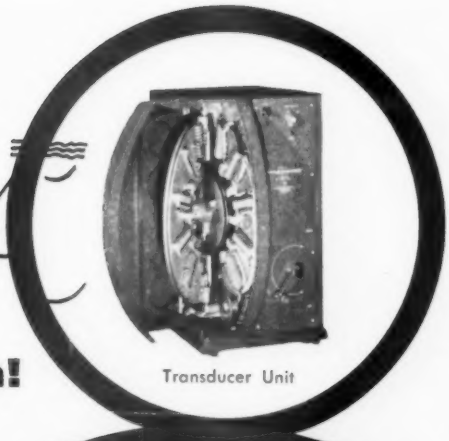

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**FOUR BUILDINGS** are in multimillion-dollar expansion program as . . .

# Halliburton Adds to Facilities

**Halliburton Oil Well Cementing Co. is putting finishing touches on a multimillion-dollar expansion program.**

The new facilities were begun last December.

Logan D. Campbell, vice-chairman of Halliburton, and L. B. Meaders, president, put it this way:

"These projects mean we can enlarge our technical staff and rearrange office facilities. The continual expansion of our business dictated the need for the projects."

Much of this expansion in Halliburton's business in recent years has been in such fields as hydraulic fracturing, electrical well service, and testing and completion work.

But the bulk of Halliburton's business is still reflected in its name: The company says that oil well cementing still leads all its other services by far.

**Three major construction jobs are nearing completion,** the company told PETROLEUM WEEK last week. They are:

- A new wing on the main office building, at Plant No. 1. The four-story addition will increase by 28,000 sq. ft. the building's present 45,600 sq. ft. of space. It will be completed Sept. 15.
- A new wing on the Research Technical Center, near Plant No. 2. This addition will add 19,020 ft. to the present 32,250 sq. ft. area, and will be ready for use Sept. 15.

The purpose of this new addition, Campbell and Meaders point out, is to make room for more engineers, chemists and other technical people.

- A new warehouse for the fabrication section, at Plant No. 2. This structure is slated for completion on Nov. 1 and will contain 20,000 sq. ft. of floor space.

**In addition, Halliburton only last year completed a huge new 52,500-sq. ft. machine shop at Plant No. 1**—the largest nondefense machine shop in Oklahoma.

This shop, located on the northwest corner of the company's properties at Plant No. 1, is exceeded in size only by the government-owned operations at Tinker Field at Oklahoma City, and perhaps by the huge Douglas Aircraft Co. bomber plant in Tulsa.

It is in this machine shop that Halliburton builds, "from the ground up," special oil-well-cementing and other equipment, to be installed on trucks, barges, and the like.

# What's New / IN EXPLORATION, DRILLING, PRODUCTION

## First Dual Oil Well O.K.'d in New Mexico

**For the first time, the New Mexico Conservation Commission has approved a dual oil completion.**

Heretofore, the regulatory body has permitted dual completions only when one zone produced oil and the other gas. Never before has it allowed a dual completion from two gas or two oil zones.

First to receive permission to complete an oil well dually was Sinclair Oil & Gas Co. in the Dean area of Lea County. Production is from the Devonian and Strawn.

•

## Waterflood for Nebraska

**The Nebraska Panhandle's first waterflood secondary recovery project is planned for the Enders field in Kimball County.**

Rock Hill Oil Co. plans the waterflood in the 1,500-acre field, located 10 mi. southeast of Kimball.

Additional recovery from the field as the result of the waterflood is estimated at 3½-million bbl. of oil.

The field is one of the oldest in the Nebraska portion of the Denver-Julesburg Basin, having been discovered in 1951.

The Enders field has 37 producing wells, of which 30 are controlled by Rock Hill, five by Stanolind Oil & Gas Co., and two by Great Basins Petroleum Co.

•

## Oil Properties Bought

**Purchase of 275,000 acres of producing and nonproducing oil properties in Louisiana involves $15-million cash.**

The purchase was made by John W. Mecom, San Jacinto Petroleum Corp., and Waterford Oil Co. from H. J. Lutcher Stark and Lutcher & Moore Lumber Co.

Mecom owns 50% of the purchased properties and the two oil companies own 25% each. Under an agreement, Mecom has management and use of surface rights of the properties on a long-term lease.

Properties are located in Assumption, Calcasieu, Cameron, LaFourche, Terrebonne, and St. Martin parishes. The producing properties are in the Cameron, Meadows, Mud Lake, Second Bayou, Pheonix Lake, East Lake Paloured, Chatahoula, and Amelia fields.

**G. B. Howell, Dallas, is seeking to buy one of the Texas Panhandle's oldest oil institutions, Johnson Ranch Royalty, Inc.**

He has offered approximately $1.2-million with 70% of the stock already in escrow. The royalty firm's holdings consist of 8,000 acres in Hutchinson, Hansford, Gray, Carson, and Roberts counties.

**Crescent Corporation, through a subsidiary, has contracted to purchase nine wells on 1,200 acres in Acadia Parish, La.,** from Elge Rasberry and others for approximately $2-million.

**Parker Petroleum Co. Inc., Ponca City, has purchased Frederick Petroleum Co., Wilmington, Del.**

Consideration for the 300 b/d of production in the Albany area of Shackelford County, Tex., was 122,070 shares of common stock and $55,000 cash. The properties are subject to an oil payment of $500,000.

•

## PG&E to Store Gas

**The Pleasant Creek gas field, near Winters, in Yolo County, Calif., will be used by Pacific Gas & Electric Co., for its first natural underground storage.**

Discovered in 1948, the field had an estimated original reserve of 5.6-billion cu. ft. Present reserves are estimated at 2.4-billion cu. ft.

PG&E will construct a 2,640-hp. compressor station at the site to pump gas below the surface. It will be capable of injecting gas at a maximum rate of 36-million cu. ft. per day.

When in operation the project will be capable of delivering gas into the company's system from storage at a maximum rate of 80-million cu. ft. per day. Three existing wells will be used and six new ones will be drilled.

The storage zone lies beneath a 2,200-acre area. PG&E has acquired the interests of Shell Oil Co. and Mohawk Petroleum Corp. in the underground zone. Gas will be stored at 2,800 ft.

**A Bakersfield (Calif.) machinist has invented a new type of coupling for casing and tubing to serve as a quick-sealing device for finishing the job of cementing wellheads.**

The new coupling, invented by Lester L. Eckenby, makes it possible for only one man to complete the seal job, which is ordinarily a laborious and often risky job for the drilling crew.

Principle of the new coupling is a rubber seal inside the coupling which is also fitted with steel grips that slip into place and are held by suction. Patent is pending on the device, which has been purchased by Chiksan Co.

•

**District Council No. 1 of the Oil, Chemical & Atomic Workers International Union, has taken a stand against California's proposed conservation law** (PW—Apr.20'56,p9).

The council, representing some 15,000 California workers, blasted the measure at its quarterly meeting in Bakersfield, calling it a bill to control oil production, not conservation.

The council asserted the measure, which has been placed on the November ballot, would turn control of the state's oil fields over to what it called a "politically appointed" commission.

•

**A total of 2,911 acres of tribal lands and 5,580 acres of allotted lands in South Dakota will be offered for lease July 26** at a sealed-bid sale at the Pierre Indian Agency, Pierre, S. D. Lands are all in the Lower Brule Indian reservation and all are in Lyman County.

The offering is east and south of previous leasing.

•

**A unitization plan for the Cisco sand reservoir of the Wilbarger County regular oil field has been approved by the Texas Railroad Commission.**

Operators expect to increase oil recovery by 150,000 bbl. by cooperative water injection. Application was made by John and Pat O'Neil, et al.

•

**Amerada Petroleum Corp., et al, have asked permission to unitize the**

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**Adair Wolfcamp field in Gaines and Terry counties.** The Texas Railroad Commission will hold a hearing on the request July 19 in Ausin.

•

**Slick Secondary Recovery Corp. has been formed at San Antonio.** Tom B. Slick is chairman of the board and Dr. Robert V. West, Jr., is president.

•

## Drilling Highlights

**California**—Richfield Oil Corp. is resorting to a drilling island to cut costs of preparing locations for wells in the Northeast Wheeler Ridge pool of Kern County. With recent locations requiring as long as a month to grade in the mountainous field, Richfield elected to consolidate three locations in one on section 27-11n-20w. First well to be drilled from the oversized location will be No. 82-27 ROC-KCL-G, to 4,400 ft. to test the Fruitvale sand.

**West Texas**—Second pay zone has been discovered in the North Smyer Canyon area of Hockley County at Honolulu Oil Corp. No. 20-A Ellwood Estate, section 31, block A, R. M. Thompson survey. The new zone—Strawn Lime—yielded 1,015 b/d on ½-in. choke at 9,968-88 ft. from the regular zone, the well gauged 1,067 b/d at 9,610-38 ft.

**Louisiana**—A new gas-producing sand has been uncovered in the South Bell City field of Calcasieu Parish, at Michel T. Halbouty No. 1 Morgan Unit. Located ¾ mi. east of the field, the well found the new pay in the Chibicides zone. The well rated an open flow potential of 50-million cu. ft. per day accompanied by 10 bbl. of condensate per million cu. ft. Total depth is 11,825 ft.

**Utah**—Shell Oil Co. has racked up its fourth discovery in the Paradox Basin. This one is No. 3 Bluff Unit, section 4-40s-24e, which returned 2,000 ft. of 40-gravity oil on 2½ hr. drillstem test at 5,454-529 ft. The discovery is on a trend with the Aneth field, and south of previous drilling on the Bluff Unit. Shell has a 68% working interest in the unit, with Three States Natural Gas Co., Dallas, holding the remaining 32%. Shell's recovery of oil at the Bluff Unit has attracted more than usual attention because of the possibility that this recovery may establish a trend of Pennsylvanian reefing through the Paradox Basin.

# Venezuela Offers New Oil Acreage

**Six more Lake Maracaibo lots put up for bid by oil companies. And more offerings may come soon.**

**CARACAS—Competition for new oil concessions in Venezuela became even hotter last week as the government called for bids on six more of the highly prized Lake Maracaibo lots. This is the second concession offering** and covers a total of 17,278 hectares (42,677 acres). Bids were due July 13.

This is not to be confused with the government's earlier call for new bids by July 6 on three blocks still available from its first offer of eleven 10,000-hectare blocks in the middle of the lake (PW—Jul.6'56,p5). Bidding was reopened on those blocks, reportedly because earlier bids were below the minimum.

**The new offerings are all national reserve areas,** and hence were published in the Official Gazette, as required by law, on July 5. National reserves are those areas which have previously been under exploration concessions, and subsequently returned to the government when reduced for exploitation concessions.

**The six new offerings include some small lots, portions of larger concession blocks. All of them are in the vicinity of the first 11 blocks offered.** One is in the center of the lake, the other five in the eastern section, ranging from about 8 to 12 mi. offshore. The six new lake offers are:

(1) Group 75: a complete block of 3,146 hectares, roughly in the middle of the lake, bordering present Creole and Shell concessions;

(2) A 4,122 hectare section in the northwest part of Lot V-574, near the eastern shore, surrounded by Shell, Creole, and Mene Grande concessions;

(3) An 841-hectare area in the central part of Lot V-574;

(4) A 4,329-hectare portion in the center of Lot V-575, which is just south of V-574 and bordered by a Mene Grande concession;

(5) A 797-hectare section in the northwest part of Lot V-575; and

(6) A 4,041-hectare section in the northwest part of Lot V-576, just south of V-575.

**A much higher minimum bonus was set for the second offering than for the first.** The minimum for the six new lots was increased to 5,000 Bolivares per hectare, or $607.29 per acre. On the first offering, the minimum was fixed at 4,000 Bolivares, or $485.83 per acre.

**But Caracas oil men predict the bonuses paid for these new national reserve offerings will be double even the new higher minimums. Some of the acreage is said to be as good as "money in the bank."**

This is particularly true near the eastern shore. Mene Grande has bordering concessions. The nearest present production is Creole's Bachaquero field, about 8 to 10 mi. north.

The new group 75 offering in midlake, however, as well as the tracts previously awarded, are some miles from production in Lagunillas and Tia Juana fields, and the geology of the tracts is believed not closely related to producing areas.

**The new concession offer specifically requires winning bidders to cooperate with the government in its plans for a nationwide gas distribution network** (PW—Jun.22'56,p25).

Beside requiring that gas be conserved, the government can also require the concession holder to turn over 16⅔% of the gas produced and destined for reinjection.

This means that the government reserves the right to take a 16⅔% gas royalty in kind for use in its gas network. The concession holder can elect to provide an equivalent amount of gas from some other concession. If the government does not require its share of the gas, the operator can dispose of it as he pleases.

**Basic refining and royalty requirements for the new concessions are the same as those specified for new grants earlier this year.**

Concession holders must refine 15% of their production within Venezuela (as against 10% specified in the previous concession awards 11 years ago).

An additional royalty of 8% will be assessed on crude oil refined outside of Venezuela in the Caribbean area, in centers considered to be nonconsuming (PW—Apr.13'56,p28).

Royalties will be the standard 16⅔%.

**But companies may be required to pay an additional 8% as a production tax,** the official government announcement said.

**It's now estimated that the winning bids for the first eight blocks in the earlier lake offer total even more than $200-million,** virtually double the the minimum for all 11 blocks. And the new bids on the remaining three will hike this. The take so far is roughly twice as much as the government got for all concessions awarded in 1944 and 1945.

Oil men in Caracas observe that the bids, though record-breaking for Venezuela (ranging from about $900 per acre to more than $1,100), are comparable to the high bids for Gulf of Mexico offshore tracts. But the Maracaibo tracts, they note, are better oil lands.

**Official announcement of winning bidders for the first concession offering was still being delayed last week, though eight of the eleven blocks have been settled.** The President said he would make the announcement at the next meeting of the National Production Council.

The eight blocks thus far settled are slated to go to: Mene Grande (Gulf Oil)—four blocks; Shell—one block; Creole (Jersey Standard)—one block; a combine of Sun Oil and Atlantic Refining—one block; and a four-company group of Pure Oil, Signal Oil & Gas, Hancock Oil, and Standard Oil of Ohio—one block.

The Pure Oil group has not decided who will operate their concession. It depends on what other concessions they get and on how big their oper-

## Seek Oil Rights In Venezuela Gulf

**CARACAS—Eighteen companies are reported to have applied for offshore oil concessions in the Gulf of Venezuela.**

They include all 14 companies operating here plus Inversiones Petrolaras (French group), Venezuelan Leaseholds, Inc. (U.S. group), Iberica des Petroleos (Spanish), and an unidentified firm.

There are no concessions in the Gulf at present.

ation will be. Their concession is described as best of the first offering.

Sun, which is expected to be the operator on the joint concession with Atlantic, reenters Venezuela through this new bid. It previously held acreage years ago.

**Though bidders on the second concession offering are not yet known, the ranks of those known as interested in concessions grow almost daily.**

Superior Oil reportedly is preparing to spend around $60-million on concessions. And Union Oil is said to be bidding heavily.

Phillips' president, Florian Floyd, said publicly that Phillips has applied for concessions in several areas, including the lake, and is prepared to spend "unlimited" amounts on development. Present Phillips concessions are all in the East.

Shell's vice-president, G. C. K. Dunsterville, says Shell plans a "big investment" in concessions. He says Shell is drilling 80 wells in the lake and plans a gas conservation plant there.

A group of six American independents, whose names are being withheld, is bidding on lake tracts. One of them reportedly has obtained a $200-million bank loan on his American properties.

**Many U.S. individuals are also cropping up.**

One group is reportedly represented here by the Cuban Ambassador to Venezuela, Dr. Jorge Govantes Aguirre. It includes Johnny Meyer, of Las Vegas, formerly with Howard Hughes; American Leduc Oil Co.; Lowel Birrell, of New York, owner of Doeskin Tissue Co.; Cuban American Oil Co.; Harold Gross, connected with a Havana racetrack, and others. They are said to have 5-million acres leased in Cuba.

Another group is Venezuelan Leaseholds, Inc., which reportedly wants to bring in an operator to drill its concession in return for half of the oil after the operator has recovered his investment.

**Another newcomer is a Spanish company, which plans to invest $50-million in Venezuela. A French group is also interested.**

Ignacio Fierro, millionaire Spanish banker and industrialist, said Cia. Iberica de Petroleos S.A. has submitted bids for concessions and is ready to begin immediate exploration and development.

Fierro is an official of the new company, which was registered in Venezuela earlier this year. He flew to Caracas last week to confer with officials of the Ministry of Mines & Hydrocarbons and returned to Madrid the same day.

Another Spanish firm, Cia. Espanola de Petroleos, holds 87,400 acres of concessions in Venezuela but does not produce oil. The French group is Inversiones Venezolanas, S.A.

**More Venezuelan offerings are due shortly.** The Ministry now indicates it may offer new tracts every two or three weeks.

Areas of special interest are the national reserves around the Mara field, northwest of Lake Maracaibo, where Creole, Mene Grande, Shell, and Texaco have production. Another areas is Barinas, southeast of Lake Maracaibo.

# What's New / AROUND THE WORLD

## Banker Gets Oil Rights

**PUERTO RICO—Houston investment banker Frank H. Crerie, who won out on oil leases when three independent oil operators were turned down, plans to have an oil company handle operations on an interest basis.** This will be the first of a series of deals he expects to make on oil operations abroad, the banker says. He's currently looking at lands in South America and the Far East.

Crerie's application for 40 20-year oil leases, mostly in the southern part of the island, was accepted last week. The Mining Commission said Crerie, who promoted the financing of a sports palace in Puerto Rico, was the only one of four applicants that met requirements. The three rejected were: Gordon-Hildebrand, Inc., Houston; Gilliam Oil Co., Evansville; and John W. Mecom, Houston.

According to the Puerto Rican petroleum regulations, the 40 leases (which include development rights) would amount to some 1,500 sq. mi. At the moment, Crerie says he and William Wallis, Toronto oil consultant, have been awarded leases covering 10 sq. mi. in the southern end of the island. He expects to get others soon.

Drilling is slated to begin in this southern area within the next two or three months. No wells have previously been drilled in Puerto Rico.

Crerie says he applied for the acreage in January, after extensive geological study of the area by Wallis. The latter was manager of J. Paul Getty's overseas operations until mid-1954.

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## New Persian Gulf Test

**PERSIAN GULF—A British Petroleum affiliate is getting set to drill the first deep test in its Persian Gulf concession area off the coast of Abu Dhabi.** The well will be located some 20 mi. off the small island of Das, which is 60 mi. from the mainland. The test will be drilled by Abu Dhabi Marine Areas, Ltd. (owned ⅔ by BP and ⅓ by Cie. Francaise des Petroles).

A special barge now being built will mount a rig capable of drilling to 15,000 ft. and will be towed to the Persian Gulf, BP says.

A base camp for the operation has been started on Das, including a harbor and an airstrip for helicopters.

BP estimates total cost for the operation at $14-million.

•

## Two Cuban Oil Strikes

**CUBA—Two new oil discoveries made news in Cuba last week.**

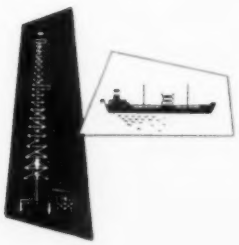
Cuban American Drilling & Exploration Co. said its No. 1 Catalina flowed 25 bbl. of 35-gravity oil on a 50-minute drillstem test from 7,100-37 ft. Operator has run casing for completion attempt. The well is in Camaguey province, 2 mi. south of the Jatibonico field and 2 mi. north of La Catalina.

At the same time, swabbing to test is continuing at Cuba's first Lower Cretaceous producer, drilled on a concession held by Pacheco Petroleum Co. in Pinar Del Rio province. The well, Meesary-Pacheco No. 1, is located 3 mi. north and 5 mi. west of Cayajabos.

Recovery of oil on swabbing tests varies from 10 to 30 b/d through perforations in 5½-in. casing from 1,300-450 ft. The well has been acidized with 1,900 gal. Upper Cretaceous was encountered to 190 ft., Lower Cretaceous to 1,690 ft., and Jurassic to 1,857 ft., total depth. Interest in the well is held: 25% by Pacheco, 25% by Cuban Canadian Petroleum Corp., and 50% by C. J. Simpson Drilling Co., of Cuba.

INDONESIA comprises the largest group of islands in the world, stretching out along the equator for more than three thousand miles . . . Java, home of the nation's capital, Djakarta, with 54 million of Indonesia's 80 million citizens, is about the same size as New York State. Sumatera, Kalimantan (Borneo), Bali, Sulawesi (Celebes)—these and other exotic islands of the group have a combined land area of about 735,000 square miles. Indonesia's modern economic history goes back to the 15th and 16th centuries, when Portuguese and Dutch traders began developing the spice trade and the "fabulous wealth of the Indies." An independent, democratic republic since August 17, 1945—and the world's third richest country in known natural resources—Indonesia is today spending millions of dollars to modernize and expand its industry, agriculture, and transportation, at the same time increasing its world exports of rubber, petroleum products, tin ore, copra, tea, tobacco, palm oil, coffee, pepper, and sugar.

*Standard-Vacuum's part in the development of Indonesia's petroleum industry covers a wide range of operations from geophysical exploration and production through transportation, refining, and marketing of petroleum products. Ninety-six per cent of Stanvac's 14,000 employees in this area are Indonesian nationals.*



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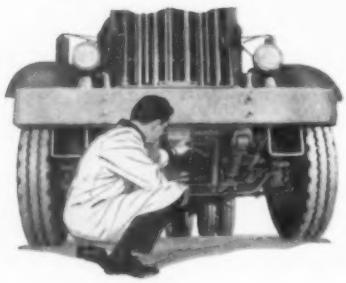

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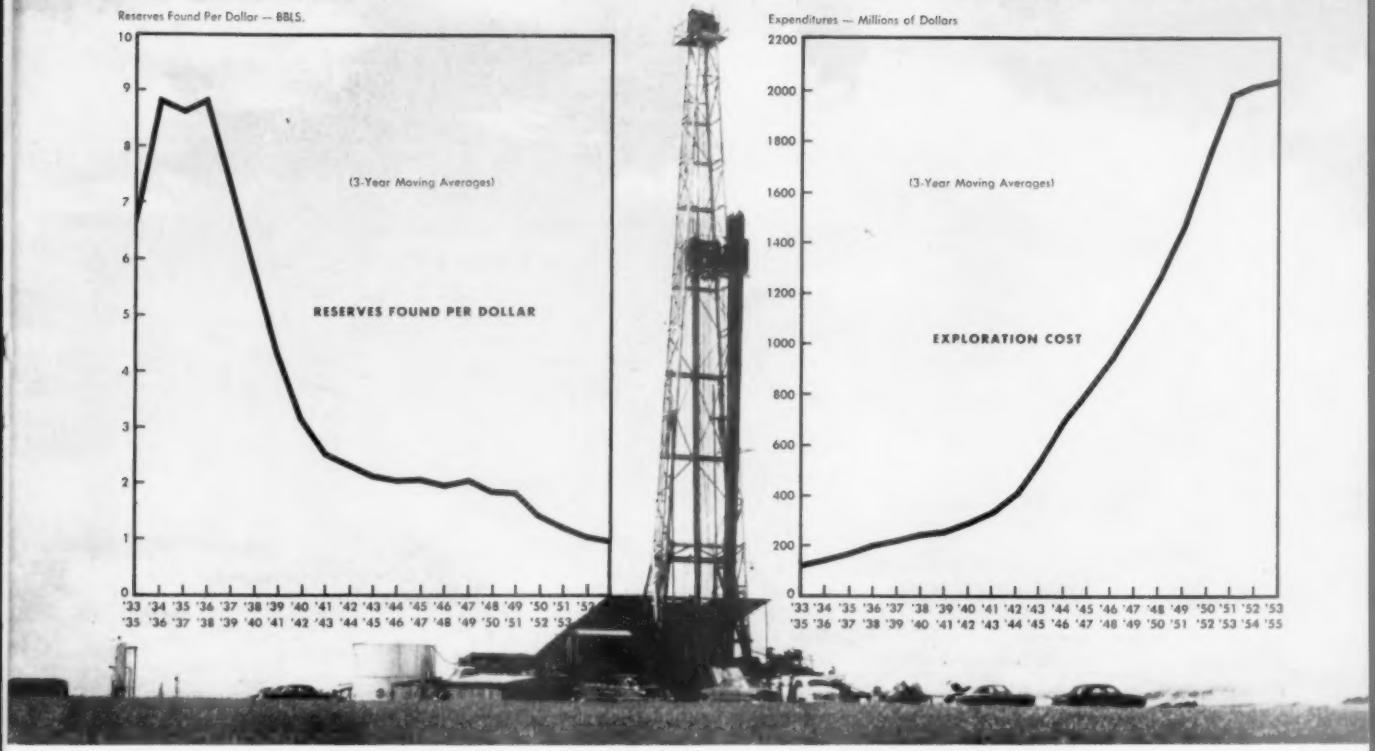



**STATISTICAL PROOF** that oil field problems deserve national attention comes from data like this, showing in detail how . . .

# Cost of Finding Oil Keeps Climbing

**Henry J. Struth . . .**

**. . . is well known in the industry for his studies on the economics of the oil and gas industry. An oil consultant with offices in Dallas, Struth got his early industry training and practical experience in the oil fields and refineries of Oklahoma and Kansas. He originated and compiled *The Petroleum Data Book* and *World Petroleum Report*.**

**Struth has long been identified with the industry in trade association, trade journal, and government activity. He has been a member of the American Institute of Mining, Metallurgical, & Petroleum Engineers since 1929, and has served on many oil industry advisory committees.**

## The case for percentage depletion and higher crude prices is made by Dallas oil economist in an exhaustive study of U. S. exploration costs

By H. J. Struth

**It's time for everyone to realize what the oil producer has known all along: Oil is getting harder to find in the U.S. Finding it is costing more than ever before. And failure to understand these trends can lead the industry and the nation into serious trouble.** (Charts and tables showing what's happening in detail are on pages 26-32.)

Today it is clear that:

- First, oil producers must continue to have the help of percentage depletion in financing their hunt for oil. If anything, the percentage should be increased from 27½%.
- Second, the price of crude oil should be raised.
- Third, producers should not be hamstrung by government controls, such as the Federal Power Commission now wields over natural gas production.

If the producing end of the business is weakened, oil transportation, refining, and marketing cannot stay strong. For this reason, all oil men have a stake in the solution of oil field problems.

Oil critics who attack the soundness of the depletion statute, or the producer's freedom of operation, should be confronted with the economic facts.

And it is hard to argue with facts like these:

## I. Wildcat Return Drops

**The success ratio of discovery wells in the U.S. has been declining. So has the volume of oil found per well** (page 27). Big strikes, like East Texas, Oklahoma City, and Kettlemen Hills, have eluded the wildcatter in recent years.

Proof that oil is getting harder to find each year lies in the footage drilled. Last year, oil men drilled an average of 186,000 ft. to find a million bbl. of new reserves. But in 1950 they had to drill only 101,600 ft. to get a mil-

lion bbl. And in 1945 the footage was only 77,000 ft.

Putting it another way, oil men last year had to drill 41 wildcats to find a million bbl. of new reserves. But in 1945 they had to drill only 18.

Also, oil reserves found last year by the average successful wildcat totaled only 353,000 bbl. This was well below the averages of 476,000 bbl. for 1954, and 445,000 bbl. for the past six years.

A hard fact: Of 22,553 exploratory wells drilled last year, including development dry holes, only 1,833 were successfully completed as oil producers.

## II. Exploratory Costs Mount

**Because of such a shrinking return, plus rising costs of labor and equipment, oil men last year had to spend $1.15 for each barrel of new reserves discovered. This was far above the cost of 20¢ a bbl. in the prewar period, 1938-1940** (page 30). Figures are on a net-barrel basis, after royalties.

The $1.15 figure for 1955 was up from the $1.13 average for the three years 1953-1955. And it was well above the 77¢-a-bbl. average for 1950-1952.

By many other yardsticks, oil field costs are soaring. For example, the drilling cost of all exploratory wells last year (producers and dry holes) averaged $66,820 per well. Added to this were other costs, such as leases and geological, geophysical, and general overhead. These came to $40,833 a well. The combined total was $107,653—compared with an average cost of only $37,232 back in 1938-1940.

Also, for each successful producer completed last year in new fields or extensions of fields, oil men drilled 5½ dry holes. Lumping the costs of both producing and dry wells brings the average 1955 cost for a new oil structure to $806,620.

**Furthermore, in the search for oil in previously unexplored areas (not counting extensions of fields) oil men drilled eight dry holes for every producer.** On this basis, the combined cost of finding a new structure was $1,104,000. And this does not include the large cost of later development wells within a structure.

The growing difficulty of finding new pools shows up in statistics reported by the API Committee on Reserves. New-field discoveries amounted to only 544-million bbl. last year—against 672-million bbl. found in 1954.

The rising cost of finding oil in strictly new fields is very striking on a per-barrel basis. The figure for 1955 was at an all-time high of $2.59 a net bbl.—a big jump over the $1.79 cost for 1954 (page 29).

Nationwide, the new-field costs last year came to a grand total of $1.2-billion. For 1954, the figure was about $1-billion.

## III. Spending Rise Ahead

**Underlying the whole cost situation is the fact that the industry will have to double its spending on the search for oil in the next ten years.** Projections of market demand for that period point to the need for average annual well completions of 72,800. This would include 16,500 wildcats and 56,300 development wells.

The total cost of such a ten-year program may run to at least $53-billion, compared with expenditures in the past ten years of about $27-billion.

Despite continual improvements in drilling methods and in over-all efficiency, it is unlikely that oil finding and replacement costs will drop much below present levels. This is based on the fact that inflationary trends in the prices of basic commodities used by the industry will continue. And high wage rates will prevail.

**The greatly increased spending is needed to preserve the industry's outstanding record of providing the nation with a cushion of reserves** (page 32). At the present annual production rate, the nation's proved reserves are equal to about 13 years' supply. But this does not mean the country will be out of oil by 1969. Oil men have consistently maintained reserves at a safe margin above year-to-year requirements. During the past 25 years, the available future supply of oil has consistently been maintained in the ratio of 11 to 14 times annual production. And with few exceptions, annual discoveries have exceeded productive needs by a big margin.

Taking a long look back, the steady increases in U.S. demand have called for total production of more than 40-billion bbl. of oil over the years 1933-1955. Yet in this same period the nation's proved reserves have risen from 14-billion bbl. to more than 35-billion.

Because new-pool discoveries have declined from prewar years, extension and development drilling will continue to be a larger and larger factor in producer's costs.

The danger is that these and other costs will get out of control.

## IV. Producer Needs Help

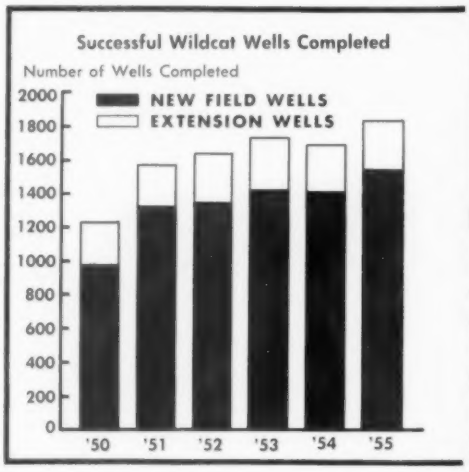
**Clearly the price of crude is out of line. It should be 40¢ a bbl. higher, at the minimum. And it is most unfortunate that supply-demand conditions continue to block an increase** (PW—Jun.15'56,p9). The need for higher prices is shown by many measuring sticks.

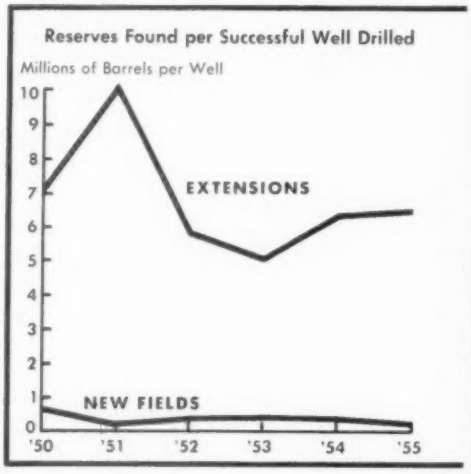
For example, the combined costs of finding, developing, and producing crude are now about 1.5 times greater than in the years 1946-1950. But the price of crude was advanced only 1.3 times (page 31).

The inequity is even more pronounced when present and prewar factors are compared. The industry's costs are now 3.5 times greater than in the years 1936-1940. But crude prices have risen only 2.6 times. This means that the price of crude has lagged to the tune of 95¢ a bbl.

By either computation, prices have not kept pace with costs. Today's average price of crude should be somewhere between $3.22 and $3.77 a bbl.—instead of the current $2.83.

## Wildcat Return Drops



## How Drilling Has Increased, and New Reserves Per Well Have Declined, Since 1950

| Wildcats | 1950 | 1951 | 1952 | 1953 | 1954 | 1955 | Total 6 Years |
|---|---|---|---|---|---|---|---|
| Oil wells, new fields | 980 | 1,320 | 1,340 | 1,415 | 1,412 | 1,540 | 8,007 |
| Oil wells, extensions | 245 | 260 | 300 | 308 | 273 | 293 | 1,679 |
| Gas wells | 233 | 260 | 265 | 347 | 386 | 345 | 1,836 |
| Dry holes | 6,606 | 8,375 | 8,960 | 9,366 | 9,267 | 10,125 | 52,699 |
| Total | 8,064 | 10,215 | 10,865 | 11,436 | 11,338 | 12,303 | 64,221 |
| Development dry | 8,418 | 8,805 | 8,750 | 10,484 | 9,927 | 10,595 | 56,979 |
| **Total exploratory** | **16,482** | **19,020** | **19,615** | **21,920** | **21,265** | **22,898** | **121,200** |
| Develop. oil wells | 22,806 | 21,485 | 21,950 | 24,277 | 27,762 | 29,822 | 148,102 |
| Develop. gas wells | 2,684 | 2,710 | 2,950 | 3,563 | 3,512 | 3,275 | 18,694 |
| **Total wells drilled** | **41,972** | **43,215** | **44,515** | **49,760** | **52,539** | **55,995** | **287,996** |
| **New fields, new pays** | | | | | | | |
| Oil wells completed | 980 | 1,320 | 1,340 | 1,415 | 1,412 | 1,540 | 8,007 |
| Reserves disc. (mill. bbl.) | 623 | 465 | 578 | 688 | 672 | 544 | 3,570 |
| Avg. per well (thous. bbl.) | 636 | 352 | 431 | 486 | 476 | 353 | 445 |
| **Extensions** | | | | | | | |
| Oil wells completed | 245 | 260 | 300 | 308 | 273 | 293 | 1,679 |
| Reserves disc. (mill. bbl.) | 1,759 | 2,637 | 1,794 | 1,660 | 1,764 | 1,932 | 11,546 |
| Av. per well (thous. bbl.) | 7,180 | 10,142 | 5,980 | 5,390 | 6,462 | 6,594 | 6,882 |
| **Composite (new fields, new pays, plus extensions)** | | | | | | | |
| Oil wells completed | 1,225 | 1,580 | 1,640 | 1,723 | 1,685 | 1,833 | 9,686 |
| Reserves disc. (mill. bbl.) | 2,382 | 3,102 | 2,372 | 2,348 | 2,436 | 2,476 | 15,116 |
| Av. per well (thous. bbl.) | 1,944 | 1,962 | 1,446 | 1,363 | 1,446 | 1,351 | 1,560 |
| **All exploratory wells** | | | | | | | |
| Total wells drilled* | 16,249 | 18,760 | 19,350 | 21,573 | 20,879 | 22,553 | 119,364 |
| Reserves disc. (mill. bbl.) | 2,382 | 3,102 | 2,372 | 2,348 | 2,436 | 2,476 | 15,116 |
| Avg. per well (thous. bbl.) | 147 | 165 | 123 | 109 | 117 | 110 | 127 |

*Excluding wildcat gas wells

**In the light of all these facts, it is obvious that the industry's percentage depletion is vital to the national interest—in peace or in the event of war. In fact, it is actually inadequate today** to provide the growing capital needed to maintain a safe level of reserves.

Unless the percentage depletion is continued at 27½% or increased to fit today's needs, the search for tomorrow's oil cannot be continued at its present vigorous intensity. And any reduction would definitely jeopardize the national interest.

The financial health of companies searching for oil is of direct interest to more Americans than is generally realized. Today the industry holds leases on at least 260-million acres of land—on which annual rentals and bonuses totaled some $556-million last year.

Also, more than 18-million acres of this land produce oil or gas, from which landowners got royalties of almost $7.7-billion in 1955.

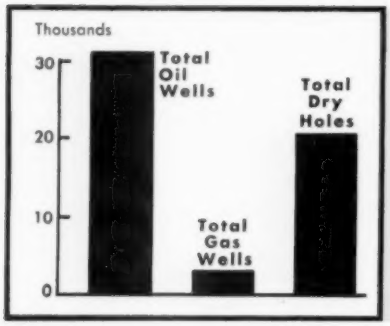
Thus the land and royalty owners of the nation last year reaped a harvest from the industry of some $8.2-billion. And in addition to the vested interest of these people, there is the direct concern of those who own oil securities, plus that of the 2-million oil company employees. For many of these people, more than oil is involved.

**Gas producers are carrying the same cost burden as the oil producer, with the added load of government control.** They must find adequate reserves to meet the growing demand for natural gas and its byproducts. But the harmful effect of the Federal Power Commission's jurisdiction over natural gas is shown by the slump in the number of gas wells completed in 1955. The drop was from 3,898 in 1954 to 3,620 last year.

The number of both wildcat and development gas wells declined. And current reports show that activity has not been stepped up over last year, with wildcat operations down considerably.

The lesson from this and from the industry's entire cost picture is clear: Unless producers are financially sound, and free to operate without controls, the public benefits provided by oil are in danger.

And the more people who know the facts about oil field economics, the less oil men will need to worry about the future.

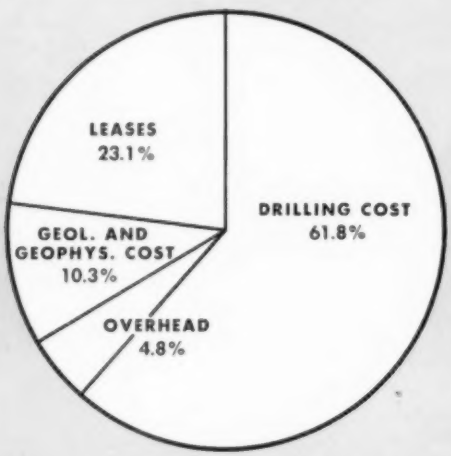



## What Drilling Was Done in 1955

| | Wildcats | Development Wells | Total |
|---|---|---|---|
| Oil wells | 1,833 | 29,822 | 31,655 |
| Gas wells | 345 | 3,275 | 3,620 |
| Dry holes* | 10,125 | 10,595 | 20,720 |
| **Total** | **12,303** | **43,692** | **55,995** |
| Per cent dry | 82.3 | 24.2 | 37.0 |
| Footage drilled (thous.) | 59,300 | 171,054 | 230,354 |
| Average depth | 4,820 | 3,915 | 4,113 |

*Excludes service wells

# Exploration Costs Mount




## How Exploration Dollars Were Spent in 1955

| | No. of Wells Drilled | Average Cost | Total Cost (Thous. $) | Per Cent of Total Cost |
|---|---|---|---|---|
| **Drilling Cost** | | | | |
| New fields, oil wells | 1,540 | $110,072 | $169,511 | 6.9 |
| Extensions, oil wells | 293 | 96,500 | 28,274 | 1.1 |
| Wildcat dry holes | 10,125 | 78,350 | 793,294 | 32.7 |
| **Total** | **11,958** | **82,880** | **991,079** | **40.7** |
| Develop. dry holes | 10,595 | 48,700 | 515,976 | 21.1 |
| **Total drilling cost** | **22,553** | **$ 66,820** | **$1,507,055** | **61.8** |
| **Other Costs** | | | | |
| Leases | 22,553 | 24,659 | 556,134 | 23.1 |
| Geolog., geophys. | | 10,974 | 247,500 | 10.3 |
| General overhead | | 5,200 | 117,275 | 4.8 |
| **Total other costs** | | **$ 40,833** | **$ 920,909** | **38.2** |
| **Grand total cost** | **22,553** | **$107,653** | **$2,427,964** | **100.0** |

## How Exploration Costs for Wildcat Producers and Dry Holes Compared in 1955

| | Wildcat Producers | All Dry Holes | Grand Total |
|---|---|---|---|
| Drilling cost (thous.) | $197,785 | $1,309,270 | $1,507,055 |
| Other costs (thous.) | 74,847 | 846,062 | 920,909 |
| **Total cost (thous.)** | **$272,632** | **$2,155,332** | **$2,427,964** |
| No. of wells | 1,833 | 20,720 | 22,553 |
| Average cost per well | 148,730 | 104,020 | 107,653 |

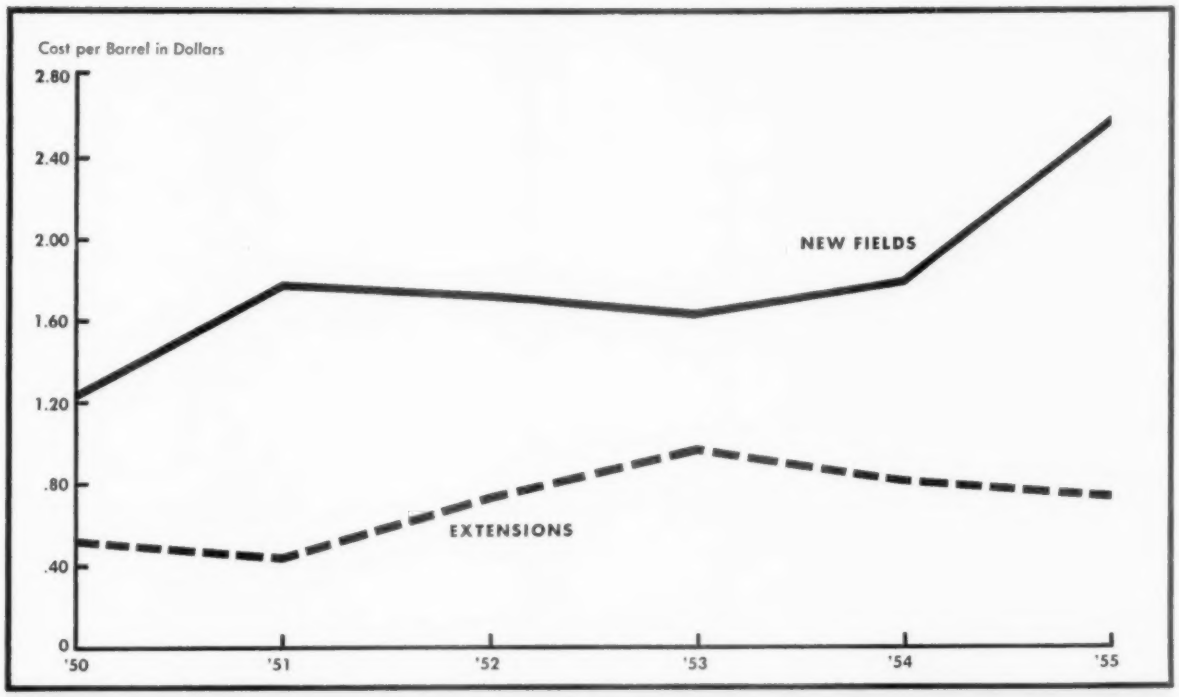
## How Discoveries Per Exploratory Dollar Have Declined Since 1933*

(3-Year Moving Averages)

| Period | Annual Exploration Expenditures (Thous. $) | New Reserves Discovered† (Mill. Bbl.) | Average per Exploratory Dollar (Bbl.) |
|---|---|---|---|
| 1933-35 | 136,180 | 938 | 6.9 |
| 1934-36 | 157,336 | 1,396 | 8.9 |
| 1935-37 | 187,648 | 1,637 | 8.7 |
| 1936-38 | 207,900 | 1,848 | 8.9 |
| 1937-39 | 232,612 | 1,744 | 7.5 |
| 1938-40 | 245,989 | 1,441 | 5.9 |
| 1939-41 | 272,516 | 1,150 | 4.2 |
| 1940-42 | 284,870 | 926 | 3.2 |
| 1941-43 | 330,339 | 873 | 2.6 |
| 1942-44 | 402,973 | 961 | 2.4 |
| 1943-45 | 552,850 | 1,228 | 2.2 |
| 1944-46 | 691,683 | 1,486 | 2.1 |
| 1945-47 | 820,574 | 1,702 | 2.1 |
| 1946-48 | 955,330 | 1,932 | 2.0 |
| 1947-49 | 1,098,391 | 2,320 | 2.1 |
| 1948-50 | 1,276,730 | 2,483 | 1.9 |
| 1949-51 | 1,478,096 | 2,760 | 1.9 |
| 1950-52 | 1,722,060 | 2,618 | 1.5 |
| 1951-53 | 1,985,185 | 2,607 | 1.3 |
| 1952-54 | 2,188,944 | 2,385 | 1.1 |
| 1953-55 | 2,335,818 | 2,420 | 1.0 |

*See chart on p. 25.

†New fields and extensions, exclusive of revisions.

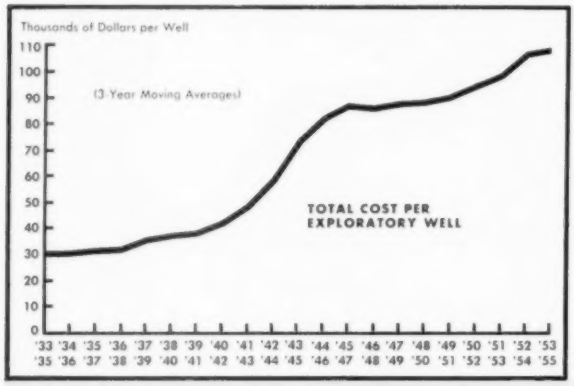


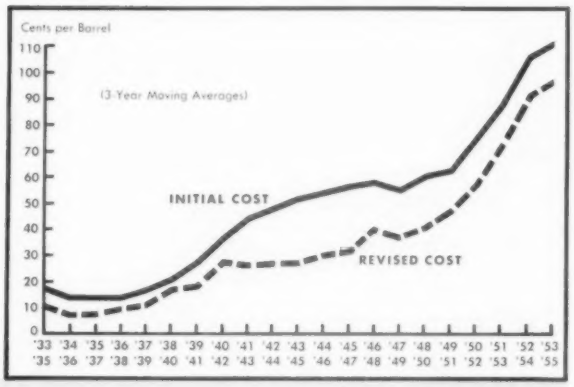

## How Initial Cost of Finding Oil in New Fields Has Risen from 1950 to 1955

| | 1950 | 1951 | 1952 | 1953 | 1954 | 1955 | Total 6 Years |
|---|---|---|---|---|---|---|---|
| Reserves disc. (thous. bbl.) | 623,000 | 465,000 | 578,000 | 688,000 | 672,000 | 544,000 | 3,570,000 |
| Net working interest (thous. bbl.) | 533,000 | 398,000 | 494,000 | 588,000 | 575,000 | 465,000 | 3,053,000 |
| Discovery wells drilled | 980 | 1,320 | 1,340 | 1,415 | 1,412 | 1,540 | 8,007 |
| Dry holes drilled | 4,855 | 6,470 | 7,050 | 7,485 | 7,480 | 8,160 | 41,500 |
| **Total wells** | **5,835** | **7,790** | **8,390** | **8,900** | **8,892** | **9,700** | **49,507** |
| Drilling cost (thous. $) | 504,700 | 539,350 | 680,215 | 755,066 | 679,285 | 808,847 | 3,967,463 |
| Other costs (Thous. $) | 156,500 | 166,660 | 186,677 | 205,599 | 349,629 | 396,080 | 1,461,145 |
| **Total cost (thous. $)** | **661,200** | **706,010** | **866,892** | **960,665** | **1,028,914** | **1,204,927** | **5,428,608** |
| Initial cost per bbl. | $1.24 | $1.77 | $1.75 | $1.63 | $1.79 | $2.59 | $1.77 |

## Breakdown of Oil Finding Costs—1950 to 1955
### New Fields and Extensions

| | 1950 | 1951 | 1952 | 1953 | 1954 | 1955 | Total 6 Years |
|---|---|---|---|---|---|---|---|
| **New Fields** | | | | | | | |
| Net res. disc. (thous. bbl.) | 533,000 | 398,000 | 494,000 | 588,000 | 575,000 | 465,000 | 3,053,000 |
| Total cost (thous. $) | 661,200 | 706,010 | 866,892 | 960,665 | 1,028,914 | 1,204,927 | 5,428,608 |
| Cost per bbl. | $1.24 | $1.77 | $1.75 | $1.63 | $1.79 | $2.59 | $1.77 |
| **Extensions** | | | | | | | |
| Net res. disc. (thous. bbl.) | 1,504,000 | 2,253,000 | 1,534,000 | 1,420,000 | 1,508,000 | 1,652,000 | 9,871,000 |
| Total cost (thous. $) | 788,150 | 1,033,565 | 1,120,353 | 1,367,919 | 1,221,092 | 1,123,037 | 6,744,116 |
| Cost per bbl. | $.517 | $.459 | $.730 | $.963 | $.809 | $.740 | $.684 |
| **Composite (new fields plus extensions)** | | | | | | | |
| Net res. disc. (thous. bbl.) | 2,037,000 | 2,651,000 | 2,028,000 | 2,008,000 | 2,083,000 | 2,117,000 | 12,924,000 |
| Total cost (thous. $) | 1,439,350 | 1,739,575 | 1,987,245 | 2,328,584 | 2,250,006 | 2,427,964 | 12,172,724 |
| Cost per bbl. | $.706 | $.656 | $.980 | $1.160 | $1.080 | $1.147 | $.942 |




## How Cost Per Barrel and Cost Per Well Have Climbed Since 1933

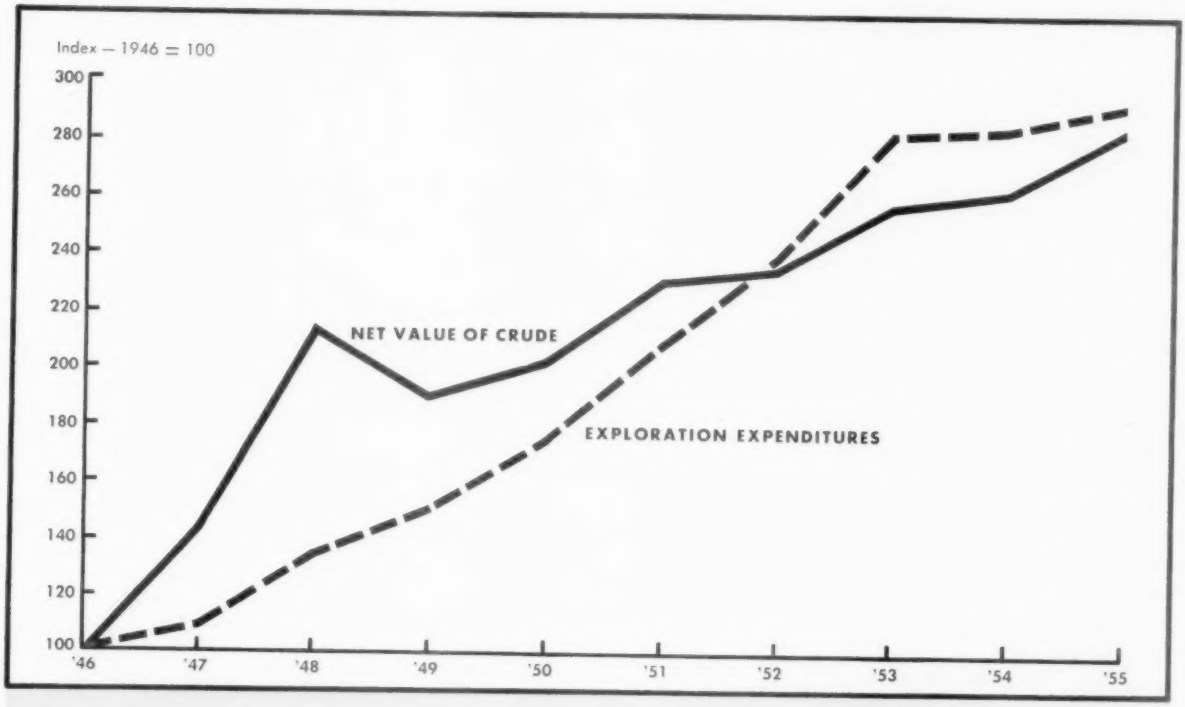
**(Incorporating new revisions in previous estimates and ultimate reflections of costs prior to 1955)**

| | Initial Reserves Disc. | | Revised Reserves Disc. | | | | | | Cost Per Barrel | | Cost Per Well | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | Gross (Mill. Bbl.) (1) | Net Working Interest (Mill. Bbl.) (2) | Gross (Mill. Bbl.) (3) | Net Working Interest (Mill. Bbl.) (4) | Explor. Wells Drilled (5) | Drilling Cost (Thous. $) (6) | Other Costs (Thous. $) (7) | Total Cost (Thous. $) (8) | Initial Disc. (9) | Revised Disc. (10) | Drilling Cost (11) | Total Cost (12) |
| 1945 | 1,581 | 1,352 | 2,835 | 2,424 | 8,187 | 365,557 | 365,650 | 731,207 | $ .541 | $ .301 | $44,650 | $ 89,313 |
| 1946 | 1,635 | 1,398 | 2,804 | 2,397 | 9,403 | 420,386 | 405,800 | 826,186 | .591 | .345 | 44,708 | 87,864 |
| 1947 | 1,892 | 1,618 | 3,302 | 2,823 | 10,401 | 481,982 | 422,350 | 904,332 | .559 | .320 | 46,340 | 86,947 |
| 1948 | 2,270 | 1,941 | 3,271 | 2,797 | 12,850 | 602,575 | 532,901 | 1,135,476 | .585 | .405 | 46,890 | 88,364 |
| 1949 | 2,798 | 2,392 | 3,855 | 3,296 | 14,025 | 696,622 | 558,745 | 1,255,367 | .525 | .381 | 49,670 | 89,505 |
| 1950 | 2,382 | 2,037 | 3,560 | 3,044 | 16,249 | 821,750 | 617,600 | 1,439,350 | .706 | .472 | 50,572 | 88,600 |
| 1951 | 3,101 | 2,651 | 3,844 | 3,288 | 18,760 | 1,018,565 | 721,010 | 1,739,575 | .656 | .529 | 54,300 | 92,600 |
| 1952 | 2,372 | 2,028 | 3,117 | 2,665 | 19,350 | 1,217,365 | 769,880 | 1,987,245 | .980 | .745 | 62,900 | 102,700 |
| 1953 | 2,348 | 2,008 | 2,647 | 2,263 | 21,573 | 1,442,150 | 886,434 | 2,328,584 | 1.160 | 1.029 | 66,850 | 107,940 |
| 1954 | 2,436 | 2,083 | 2,583 | 2,208 | 20,879 | 1,366,241 | 884,765 | 2,250,006 | 1.080 | 1.019 | 65,436 | 107,764 |
| 1955 (p) | 2,476 | 2,117 | — | — | 22,553 | 1,507,055 | 920,909 | 2,427,964 | 1.147 | — | 66,820 | 107,653 |
| **Three-Year Moving Averages** | | | | | | | | | | | | |
| 1933-35 | 938 | 802 | 1,467 | 1,254 | 4,329 | 48,354 | 87,826 | 136,180 | .169 | .109 | 11,170 | 31,524 |
| 1934-36 | 1,396 | 1,193 | 2,107 | 1,801 | 5,028 | 56,223 | 101,113 | 157,336 | .132 | .087 | 11,182 | 31,290 |
| 1935-37 | 1,637 | 1,399 | 2,534 | 2,166 | 5,760 | 67,318 | 120,330 | 187,648 | .134 | .087 | 11,687 | 32,578 |
| 1936-38 | 1,848 | 1,580 | 2,779 | 2,376 | 6,161 | 75,277 | 132,623 | 207,900 | .131 | .106 | 12,218 | 33,744 |
| 1937-39 | 1,744 | 1,484 | 2,577 | 2,203 | 6,525 | 83,779 | 147,833 | 232,612 | .157 | .135 | 12,840 | 35,649 |
| 1938-40 | 1,441 | 1,225 | 2,108 | 1,819 | 6,607 | 88,836 | 157,153 | 245,989 | .201 | .189 | 13,446 | 37,232 |
| 1939-41 | 1,150 | 977 | 1,667 | 1,442 | 6,969 | 101,696 | 170,820 | 272,516 | .279 | .198 | 14,593 | 39,104 |
| 1940-42 | 926 | 792 | 1,354 | 1,441 | 6,750 | 111,350 | 173,520 | 284,870 | .360 | .281 | 16,496 | 42,203 |
| 1941-43 | 873 | 747 | 1,481 | 1,174 | 6,679 | 133,643 | 196,696 | 330,339 | .442 | .263 | 20,009 | 49,459 |
| 1942-44 | 961 | 822 | 1,791 | 1,531 | 6,717 | 174,083 | 228,890 | 402,973 | .490 | .278 | 25,917 | 59,993 |
| 1943-45 | 1,228 | 1,050 | 2,348 | 2,008 | 7,464 | 257,027 | 295,823 | 552,850 | .527 | .275 | 34,436 | 74,069 |
| 1944-46 | 1,486 | 1,271 | 2,650 | 2,266 | 8,364 | 342,140 | 349,543 | 691,683 | .544 | .305 | 40,906 | 82,698 |
| 1945-47 | 1,702 | 1,456 | 2,980 | 2,548 | 9,330 | 422,641 | 397,933 | 820,574 | .563 | .322 | 45,299 | 87,950 |
| 1946-48 | 1,932 | 1,652 | 3,125 | 2,339 | 10,884 | 501,647 | 453,683 | 955,330 | .578 | .409 | 46,090 | 87,774 |
| 1947-49 | 2,320 | 1,983 | 3,476 | 2,972 | 12,425 | 593,726 | 504,665 | 1,098,391 | .554 | .369 | 47,785 | 88,402 |
| 1948-50 | 2,483 | 2,123 | 3,562 | 3,045 | 14,374 | 706,982 | 569,748 | 1,276,730 | .601 | .419 | 49,185 | 88,882 |
| 1949-51 | 2,760 | 2,360 | 3,753 | 3,209 | 16,344 | 845,645 | 632,451 | 1,478,096 | .626 | .461 | 51,740 | 90,437 |
| 1950-52 | 2,618 | 2,238 | 3,507 | 3,005 | 18,120 | 1,019,227 | 702,833 | 1,722,060 | .769 | .573 | 56,249 | 95,036 |
| 1951-53 | 2,607 | 2,229 | 3,202 | 2,738 | 19,894 | 1,226,027 | 759,108 | 1,985,135 | .891 | .724 | 61,628 | 99,786 |
| 1952-54 | 2,385 | 2,039 | 2,782 | 2,378 | 20,600 | 1,341,918 | 847,026 | 2,188,944 | 1.073 | .920 | 65,142 | 106,259 |
| 1953-55 (p) | 2,420 | 2,069 | — | — | 21,668 | 1,438,482 | 897,336 | 2,335,818 | 1.129 | (e).970 | 66,387 | 107,800 |

(e) Estimated. (p) Preliminary data.
(1) New fields and extensions, excluding revisions.
(2-4) After royalties averaging 14.5%.
(3) Includes revisions, allocated to original discovery years.
(5) Wildcats and all dry holes in exploration and development.
(7) Includes leases, geological, geophysical and overhead costs.
(9) Col. 8 divided by col. 2.
(10) Col. 8 divided by col. 4.

Data in this table show the extent to which initial costs are changed by later revisions in first estimates of reserves. Revisions in previous estimates have been allocated to the original discovery years. This has the effect of reducing initial finding costs per barrel of oil found. Studies show that each year's revisions extend back over a period of at least eight years.

In 1954, for example, the initial volume of 2,436-million bbl. was revised upward to 2,538-million bbl. This reduced the initial cost of $1.08 a bbl. to $1.019 a bbl. The ultimate impact is shown in the year 1947. The initial volume that year was revised from 1,892-million bbl. to reflect an ultimate credit of 3,302-million bbl. And the effect was to reduce the initial cost from 55.9¢ a bbl. to 32¢ a bbl.




## How Exploration Costs Have Compared With Crude Value Since 1946

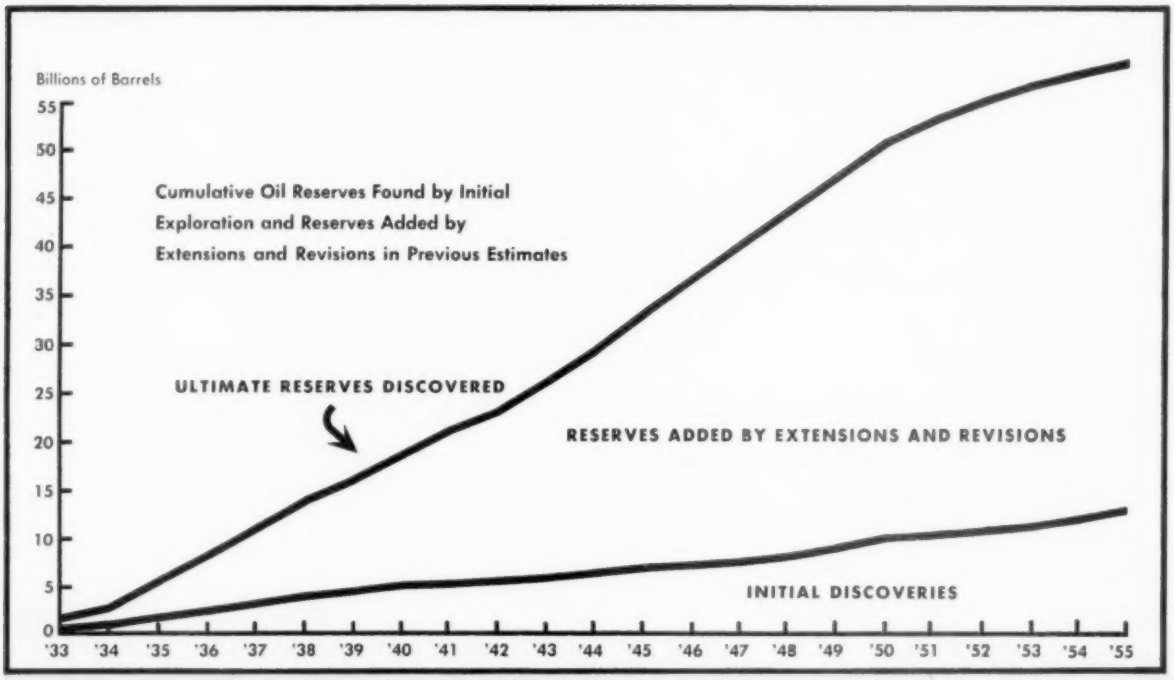
| | Gross Crude Prod. (Mill. Bbl.) | Price Per Bbl. | Gross Value of Crude (Mill. $) | Net Value After Royalties (Mill. $) | Index | Explor. Expenditures (Mill. $) | Index | Per Cent of Net Crude Value |
|---|---|---|---|---|---|---|---|---|
| 1946 | 1,734 | 1.41 | 2,443 | 2,089 | 100 | 826 | 100 | 39.5 |
| 1947 | 1,857 | 1.93 | 3,578 | 3,059 | 146 | 904 | 109 | 29.5 |
| 1948 | 2,020 | 2.60 | 5,245 | 4,484 | 214 | 1,135 | 137 | 25.3 |
| 1949 | 1,842 | 2.54 | 4,675 | 3,997 | 191 | 1,255 | 152 | 31.4 |
| 1950 | 1,974 | 2.51 | 4,963 | 4,243 | 203 | 1,439 | 174 | 33.9 |
| 1951 | 2,248 | 2.53 | 5,690 | 4,865 | 232 | 1,740 | 210 | 35.7 |
| 1952 | 2,290 | 2.53 | 5,785 | 4,946 | 236 | 1,987 | 240 | 40.2 |
| 1953 | 2,360 | 2.68 | 6,334 | 5,416 | 259 | 2,329 | 282 | 43.0 |
| 1954 | 2,315 | 2.78 | 6,425 | 5,493 | 263 | 2,251 | 284 | 41.0 |
| 1955 | 2,485 | 2.82 | 7,008 | 5,992 | 286 | 2,428 | 294 | 40.5 |
| **10 Yrs.** | **21,125** | **2.46** | **52,146** | **44,585** | | **16,274** | | **36.5** |

## Sources of Statistics

In most cases, prices, values, and production statistics are from official Bureau of Mines reports. Drilling and footage statistics represent the composite experience of the oil industry—as reported by scouting agencies and various official published sources. These have been averaged and adjusted to reflect representative trends. Costs of drilling, geological, geophysical, leases, and overhead are based on reported experience of typical operators. These are weighted to reflect combined national averages. Allocation of revisions and extensions to prior discovery years are based primarily on studies of major field developments and a proration of unidentifiable credits to prior years on a historical percentage method, adjusted to changing conditions from year to year. While regional and individual company oil-finding costs are decidedly variable, these studies represent a reasonably reliable indication of the industry's average experience in the U. S.

Any differences between the reserves reported by the author and those reported by the Joint Committee on Reserves of API and American Gas Assn. result from the author's use of actual annual production figures reported by the Bureau of Mines. The API committee necessarily estimates production each year in advance of final figures. These differences are adjusted in later computations of reserves. The data on reserves in the tables on these pages have been revised in this respect, resulting in adjustments in the year-end reserves reported by the API committee. But this does not materially alter the figures of the committee—H. J. Struth

# Reserves Still Growing




## How Crude Reserves Have Grown Since 1933

(Millions of Barrels)

| Year | Est. Res. Jan. 1 | Discoveries (a) New Pools | Discoveries (a) Extensions & Revisions | Discoveries (a) Total Oil Added | Production | Net Increase | Allocation of Extensions & Revisions | Ultimate Credit to Orig. Disc. | Adjusted Reserves Dec. 31 | Ratio Ult. Credits to Orig. Disc. | Cumulative Initial Disc. | Cumulative Ultimate Credits |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1933 | 14,335 | 350 | 300 | 650 | 939 | —289 | 884 | 1,234 | 17,024 | 3.52 | 350 | 1,234 |
| 1934 | 14,046 | 614 | 531 | 1,145 | 945 | 200 | 921 | 1,535 | 17,614 | 2.50 | 964 | 2,769 |
| 1935 | 14,246 | 955 | 330 | 1,285 | 1,036 | 249 | 1,620 | 2,575 | 19,153 | 2.70 | 1,919 | 5,344 |
| 1936 | 14,495 | 860 | 950 | 1,810 | 1,142 | 668 | 1,988 | 2,848 | 20,859 | 3.31 | 2,779 | 8,192 |
| 1937 | 15,163 | 940 | 2,850 | 3,790 | 1,328 | 2,462 | 1,878 | 2,819 | 22,349 | 3.00 | 3,719 | 11,010 |
| 1938 | 17,625 | 825 | 2,325 | 3,150 | 1,265 | 1,885 | 2,373 | 3,198 | 24,282 | 3.88 | 4,544 | 14,208 |
| 1939 | 19,510 | 360 | 2,140 | 2,500 | 1,317 | 1,183 | 2,042 | 2,402 | 25,367 | 6.67 | 4,904 | 16,610 |
| 1940 | 20,693 | 315 | 1,685 | 2,000 | 1,409 | 591 | 2,162 | 2,477 | 26,435 | 7.86 | 5,219 | 19,087 |
| 1941 | 21,284 | 455 | 1,620 | 2,075 | 1,483 | 592 | 1,907 | 2,362 | 27,314 | 5.19 | 5,674 | 21,449 |
| 1942 | 21,876 | 280 | 1,700 | 1,980 | 1,470 | 510 | 2,017 | 2,297 | 28,141 | 8.20 | 5,954 | 23,746 |
| 1943 | 22,386 | 345 | 1,265 | 1,610 | 1,594 | 16 | 2,425 | 2,770 | 29,317 | 8.03 | 6,299 | 26,516 |
| 1944 | 22,402 | 515 | 1,574 | 2,089 | 1,778 | 311 | 2,825 | 3,340 | 30,879 | 6.48 | 6,814 | 29,856 |
| 1945 | 22,713 | 440 | 1,870 | 2,310 | 1,836 | 474 | 3,212 | 3,652 | 32,695 | 8.30 | 7,254 | 33,508 |
| 1946 | 23,187 | 323 | 2,370 | 2,693 | 1,850 | 843 | 2,987 | 3,310 | 34,155 | 10.25 | 7,577 | 36,818 |
| 1947 | 24,030 | 505 | 2,211 | 2,716 | 1,988 | 728 | 3,360 | 3,865 | 36,032 | 7.65 | 8,082 | 40,683 |
| 1948 | 24,758 | 461 | 3,805 | 4,266 | 2,167 | 2,099 | 2,912 | 3,373 | 37,238 | 7.31 | 8,543 | 44,056 |
| 1949 | 26,857 | 983 | 2,592 | 3,575 | 1,999 | 1,576 | 2,699 | 3,682 | 38,921 | 3.74 | 9,526 | 47,738 |
| 1950 | 28,433 | 623 | 2,706 | 3,329 | 2,154 | 1,175 | 2,666 | 3,289 | 40,056 | 5.28 | 10,149 | 51,027 |
| 1951 | 29,608 | 465 | 4,673 | 5,138 | 2,453 | 2,685 | 1,924 | 2,389 | 39,992 | 5.13 | 10,614 | 53,416 |
| 1952 | 32,293 | 578 | 2,728 | 3,306 | 2,513 | 793 | 1,600 | 2,178 | 39,657 | 3.76 | 11,192 | 55,594 |
| 1953 | 33,086 | 688 | 3,352 | 4,040 | 2,596 | 1,444 | 861 | 1,549 | 38,610 | 2.25 | 11,880 | 57,143 |
| 1954 | 34,530 | 672 | 2,308 | 2,980 | 2,568 | 412 | 523 | 1,195 | 37,237 | 1.78 | 12,552 | 58,338 |
| 1955 | 34,942 | 544 | 2,841 | 3,385 | 2,749 | 636 | 546* | 1,090* | 35,578 | 2.00 | 13,096 | 59,428 |
| 1956 | 35,578 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| **Totals** ..... | | **13,096** | **48,726** | **61,822** | **40,579** | **21,243** | **46,332** | **59,428** | ..... | **4.54** | ..... | ..... |

(a) As reported by the Joint Committee on Reserves of API and American Gas Assn.

* Projected on basis of recent experience.

Data in this table show the effect on reserves produced by revisions of previous estimates and by extensions of old pools. Allocation of revisions and extensions back to the original discovery years makes it apparent that the proved underground inventory of petroleum liquids is actually greater than current figures indicate.

—Photograph courtesy of Standard Oil Co. of N. J.

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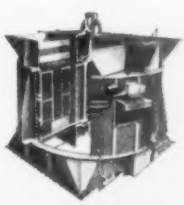

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DEPT/Refining

# New Petrochemical Boom in Canada

## Expansion in both east and west will be aided by the Trans-Canada gas line and a new LPG pipeline.

**Canada is all set for another round of petrochemical expansion, which may hit markets on both sides of the border that are now supplied by U. S. petroleum processors.**

The first ditching machines were just getting started last week on the first leg of Canada's cross-country natural gas line when announcements of new chemical plants for Canada began to appear.

Many of these are plans that had been shelved during the long controversy over the construction of the 1,800-odd-mi. Trans-Canada Pipe Line system from Alberta to Montreal. The Canadian government finally ended all doubts over building the line last month with the approval of an $80-million loan to the company (PW—Jun.15'56,p47).

**The new petrochemical building program will mean new plants in both eastern and western Canada, producing a wide range of petroleum-derived chemicals. All of these, though, will draw primarily on the great reservoirs of liquid and gaseous hydrocarbons in Alberta.**

A big portion of the planned new facilities are to be built in Ontario, principally in Canada's "Chemical Valley," around Sarnia. And others are scheduled at the nation's largest refining center, at Montreal East.

Most of these eastern Canada plants that will make basic chemical intermediates from hydrocarbons will use refinery gases as raw materials. The final decisions to build, however, were held up pending assurance that the cross-country gas line finally would be built. This will provide eastern Canada with substantial supplies of additional gas as possible raw materials for petrochemicals, such as ammonia, ethylene, and its derivatives.

**Largest of the new petrochemical plants planned will be built by Imperial Oil at Sarnia. And construction of this plant promises to pave the way for a new era of expansion in the area.**

Imperial's president, J. R. White, said last week that the $25-million plant will feed raw materials to other chemical plants "which are expected to be built nearby." He predicts that the expansion of the chemical industry in the Sarnia area based on Imperial's plant "could be several times larger than the plant itself."

Imperial has acquired additional acreage near its Sarnia refinery "to foster the growth of allied chemical plants" in Sarnia.

Imperial will build cracking units and fractionating facilities to produce butylenes, isobutylenes, and aromatic distillates, units to produce ethylene and propylene, and a butadiene plant.

The butadiene, the principal raw material for general-purpose synthetic rubber, and the butylenes will have a ready market in the nearby Polymer Corp. (Canadian government) synthetic rubber plant.

Imperial's ethylene plant will more than double Canada's capacity for this basic intermediate for plastics.

Dow Chemical of Canada has a $12-million expansion program for Sarnia to increase its capacity for making ethylene, polystyrene, and other hydrocarbon-based intermediates.

Canadian Oil Cos. is adding processing facilities to make aromatics at its Sarnia refinery.

Dupont is expanding its synthetic-fibers facilities in Ontario and is building an explosives plant.

Elsewhere in eastern Canada, Shell is diversifying the chemical-intermediates output of its Montreal East plant; B. A. Shawinigan (British American Oil and Shawinigan Chemicals) is doubling the capacity of its Montreal East petrochemical plant, which produces phenol and acetone; Canadian Industries is building a 200-ton-daily ammonia plant at Millhaven, Ont.; and Union Carbide is considering an integrated ethylene oxide and polyethylene plant at Montreal East.

**The continued petrochemical expansion in eastern Canada is prompting the building of an 800-mi. liquefied petroleum gas pipeline from Alberta** (PW—Mar.23'56,p46).

This project was announced last week as a $60-million pipeline-and-tanker transportation system to supply additional gases to the Sarnia area. Canadian Hydrocarbons, Ltd., has received government approval for the plan for a 6-in. and 8-in. pipeline from Alberta to Ft. William, Ont. From there, the company will transport propane, butanes, natural gasoline, and other light gases by tankers to Sarnia. Canadian Hydrocarbons is ordering eight lake tankers to transport the LPG.

This project is scheduled for completion by winter of 1957. Contrac-

## Mobile Lab Checks a Refinery's Pulsebeat

**Shell Development Co. has designed a field test truck to obtain operating data on refining and chemical process units. Such information is an aid to planning modifications to existing units and in designing new equipment. Instruments in the truck can record up to 14 data variables. In testing operations, a unit is purposely upset, then the lab instruments record the reaction to such a change.**

tors to Canadian Hydrocarbons are Williams Bros. and Arthur D. Little.

**Petrochemical expansion in western Canada is getting a slower start, but it is expected to grow rapidly because of the raw material availability and the industrial development in the Prairie Provinces.**

Up to now, Canadian petrochemical production has been concentrated in Ontario and Quebec adjacent to the two large refining centers.

The growth of refining capacity in the western provinces and the increasing supply of gas liquids—particularly the volume of gas liquids that will be available when the Trans-Canada line goes into service—is fostering expansion in the West to take advantage of the available raw materials for petrochemical use.

One $22-million ammonia-fertilizer plant is being built at Medicine Hat, Alta., and a second will be built at Winnipeg.

Canadian Gulf Oil has one sulfur recovery plant under construction in southwestern Alberta. Jefferson Lake Sulphur and Pacific Petroleums are building another sulfur recovery plant in British Columbia.

The eventual hope is that enough sulfur can be received from Alberta's sour gas to eliminate Canada's annual sulfur imports of about 360,000 tons.

# What's New / IN REFINING

**U.S. operating refining capacity totaled 8,380,801 b/d at the start of the year, an increase of 311,647 b/d,** according to the Bureau of Mines' annual refinery study.

An additional 251,500 b/d of crude-charging capacity was shut down, of which nearly 50,000 b/d is considered inoperative. As of the first of the year, 267,000 b/d of new capacity was under construction.

The largest gain in new operating capacity occurred on the Gulf Coast (District 3), with an increase of 150,000 b/d last year. This gives the region 3,113,400 b/d of capacity.

The only area to record a decline in operating capacity was the East Coast. The area's operating capacity was listed at 1,266,468 b/d, down 39,000 b/d from last year.

•

**High-energy liquid and solid fuels from metals continue to lead petroleum as potential fuels for missiles.**

The Navy last week awarded a contract to Callery Chemical Co., a subsidiary of Mine Safety Appliances Co., to build a $38-million plant near Muskogee, Okla., to produce high-energy fuels.

While the identity of the plant's product is being kept secret, Chemical Week, a McGraw-Hill publication, speculates that Callery may be working with metallic potassium and possibly with boron compounds. Callery recently received a patent on a method of making an alkali-metal borohydride from the alkali metal, boron trifluoride, and hydrogen.

While numerous high-heat-containing metals and other solid elements have been suggested as possible rocket and even jet aircraft fuels, boron and its derivatives continue to be the most frequently mentioned possibilities as a propellent (PW—Feb.10'56,p12).

•

**Standard Oil Co. (Ind.) and one of its affiliates will add 27,200 b/d of reforming capacity at two refineries.**

The parent company is ready to start building a second Ultraformer at its Whiting (Ind.) refinery. The new unit, of 21,000 b/d capacity, plus the 14,000 b/d Ultraformer which is to go on stream this month, will more than replace the 25,000 b/d reformer that was destroyed last year (PW—Sep.2'55,p11).

Pan-Am Southern Corp. also is adding a second Ultraformer of 6,200 b/d capacity it its El Dorado (Ark.) refinery.

•

**Imperial Chemical Industries, Ltd., will build a third ethylene unit at its Wilton (England) petrochemical plant.** When the new unit goes on stream in early 1959, ICI's polyethylene capacity at Wilton will be increased to 90,000 tons a year.

•

**Shell Chemical Corp. has awarded a contract to Fluor Corp. to design and build utilities and offsite facilities for a methyl ethyl ketone unit at Norco, La.** Fluor currently is working on similar facilities at Shell's hydrogen peroxide plant at Norco.


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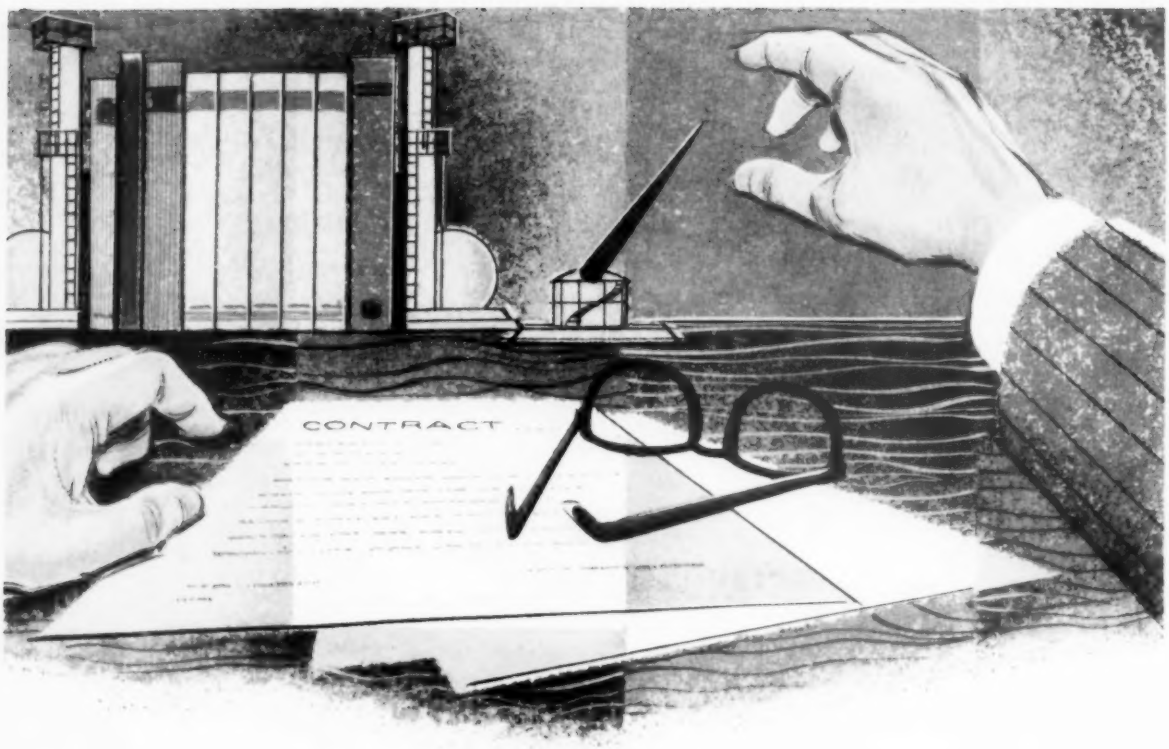


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WORLD-WIDE CONSTRUCTION FOR THE PETROLEUM, PETROCHEMICAL, AND CHEMICAL INDUSTRIES

# Oil Man to Be White House Aid

**A former California drilling contractor has taken over as one of five special assistants to President Eisenhower. He's Thomas P. Pike, an expert in the field of military supply and logistics.**

Pike takes over the job last held by Fred Seaton, who recently became Secretary of the Interior. As one of the special assistants in the White House hierarchy, Pike will operate under the supervision of Sherman Adams and Wilton Persons.

Seaton, formerly an Assistant Secretary of Defense for Public Affairs, got to know Pike well at the Pentagon. This is probably one factor in Pike's transfer to the White House. Another likely factor: Pike is a close friend of fellow Californian Richard Nixon, the Vice-President.

**Pike's specialty in his new post will be what the White House describes as "liaison with departments and agencies of the executive branch."**

This means he will rove throughout the government, keeping up with any new developments and problems. He'll report on fiscal, administrative, and even political problems in Interior, Commerce, Justice, and other departments, as well as on such agencies as the Office of Defense Mobilization and the Atomic Energy Commission.

**The heavy demands of his government work forced Pike to give up his oil drilling business earlier this year. This ended nearly a lifetime of direct contact with the oil industry.**

Pike went to work in the family business, Republic Supply Co., in Los Angeles, immediately after graduation from Stanford University in 1931. The firm was headed by his father, P. M. Pike.

Leaving Republic in 1938, Pike set up his own drilling business. The Thomas P. Pike Drilling Co. started drilling with one steam rig in the big boom of the Wilmington field.

Pike's rigs were particularly active in the Elk Hills Naval Reserve (operated by Standard Oil Co. of California) during and after world War II.

When Pike took the defense job in September, 1953, he gave up the presidency of the firm to Stanwood I. Williams, a long-time friend and college fraternity brother, who joined the company in 1944.

**Pike's drilling company was operating 18 rigs in California and one in Uruguay when it was dissolved in March of this year.**

**THOMAS P. PIKE gave up his drilling business to remain in government work. Now he's just been named Special Assistant to President Eisenhower.**

At the time the firm was dissolved it was the largest drilling contracting company in the state. Most of Pike's drilling has been done in California. Foreign ventures, however, have included a pioneering wildcat in Baja California for Petroleos Mexicanos, the Mexican oil monopoly; development drilling for E. W. Pauley in northeastern Mexico, and drilling for the government of Uruguay.

The company also operated a string of tools in Texas and the Rocky Mountain area and drilled a wildcat in Oregon for Standard Oil Co. of California last year.

A Pike rig also drilled the discovery well in the San Ardo field, in California, for The Texas Co.

When Pike went out of the drilling business, Williams and Howell G. Haney, who had been in charge of drilling, formed a new drilling company which took over the unfinished Pike contracts.

**In his last government post—Assistant Secretary of Defense for Supply & Logistics—Pike had been the Pentagon's top-level policy man in the field of military requirements, procurement, production, and mobilization planning.**

The Californian moved into the post seven months after he came to Washington. The opening came when the then assistant secretary, Charles Thomas, was moved up to become Secretary of the Navy.

Pentagon insiders say that during his first year or so in office, Pike shied away from firm decisions. They say that he acted more as a coordinator than as a prime mover in policy work. But in more recent months, they continue, Pike has been taking a firmer stand on issues and has been "throwing his weight around" a lot more as a skilled operator.

His Pentagon job also has put him into more regular dealings with various government agencies than any other top Defense Dept. official. This will be helpful in his new job; indeed, it undoubtedly was an important reason for his selection.

**He's credited with helping push through the single-manager system on all supply aspects for petroleum and other commodities used in large quantities by the military.**

Pike also has strengthened procurement regulations for the armed services by developing more uniform contract provisions among the three services.

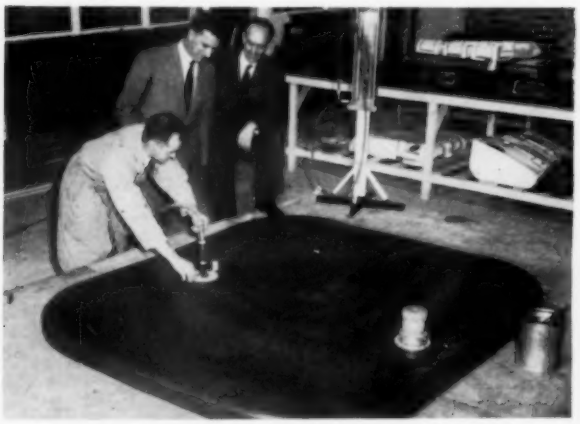
Pike's supply and logistics operations have involved him in an almost fantastic variety of problems—from setting up uniform standards for procurement of boots, blankets, belts, and T-shirts to clarifying the determination of military requirements.

With very few exceptions, his activities have had a great bearing on military spending. Example: Pike recently turned down an effort by one service to buy V-necked T-shirts, ordered it to buy U-necked shirts, the way the other services do. He figured that, by halting duplicate procurement here, the Defense Dept. will save $2-million.

**Pike—slender, earnest, and soft-spoken—still maintains his home in Los Angeles, where he was born in 1909.**

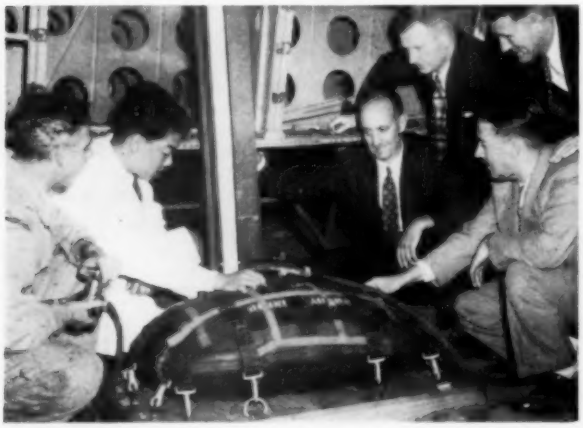
Since coming to Washington, however, Pike has been living in a rented Georgetown house. His wife, Katherine, a college sweetheart whom he married the day he graduated from Stanford, and a daughter, Mary Katherine, 16, live with him there. Another daughter, Josephine, and a son, John K., are students at Stanford in California.

Pike is a prominent Roman Catholic layman and has lectured on labor relations at Loyola University.



A RUBBER "BARREL" has been designed for hauling oil products by air. Here the venting system of a 200-gal. container is being tested. The filling fitting is at right.

WEB NETTING, here being given a strength test, holds the bag in place in the plane. C-47s and DC-3s can carry four loaded containers (800 gal.) at a time.



A SMALL MODEL is put through severe checks to make sure the bag and the harness can withstand the in-flight stresses of changing altitudes, temperatures, and movement.

VENTING EQUIPMENT is installed to provide a link with outside atmosphere through tubing in the plane's fuselage. This provides a safety outlet for any fumes.

***To supply oil products to remote points . . .***

# Fuel Hauling Gets an Air Lift

**Rubber bags are being tried as containers for oil products to be transported by airplanes.**

This new method for moving bulk petroleum products by air was evolved in Australia by aviation officers and engineers of Vacuum Oil Co., Melbourne.

Their purpose was to reduce costs on an air lift from Lae, on the coast of New Guinea, to the isolated Goroka area in the island's central highlands.

Later on, the method may be used to supply hard-to-reach points in western, central, and northern Australia.

**One advantage of the bags over steel drums is that they can be folded up to make room for other cargo on return flights.** This is expected to result in a reduction of freight rates, thus helping keep the cost of the petroleum products down. It will also eliminate the double-handling of steel drums.

**Four bags, each carrying 200 gal., can be carried in a C-47 or a DC-3.** The bags are placed in position in the planes and then filled from underground storage tanks. On reaching their destination, the bags are emptied by pumping or by gravitation. The empties are then folded to a minimum size and stored in the aircraft for the return trip.

The Mandated Airlines, Ltd., are flying the fuel air lift to the Goroka airstrip. The distance is 120 mi., and the altitude at Goroka is 5,000 ft.

The synthetic rubber (Hycar) bags are made by the aviation division of Dunlop Rubber, Ltd. (Australia). They are built to withstand working conditions of 100F at an altitude of 20,000 ft. The webbing that anchors them in place can withstand stress of up to 2,800 lbs.

**The containers can be used for all types of liquid petroleum products, including aviation gasoline.**

Almost a year was spent in developing the synthetic rubber containers.

# What's New / IN TRANSPORTATION

**Montana-Dakota Utilities Co. has been granted authority to build new pipeline facilities in North Dakota.**

The facilities, costing $1,257,020, will include a 41.8-mi line from Tioga to Williston, plus connecting lines to four other North Dakota cities.

•

**Natural gas pipeline facilities in 11 states will be expanded at a cost of more than $19-million.**

The construction—by five companies—has been authorized by the Federal Power Commission.

Largest single project approved calls for expenditure of $6,233,000 by Texas Gas Transmission Corp. for lines and facilities in Louisiana, Mississippi, Kentucky, Illinois, and Indiana. This will enable the company to increase deliveries by more than 25-million cu. ft. per day.

Other companies, added capacity, location, and estimated cost are: Texas Eastern Gas Transmission Corp. and its subsidiary, Texas Eastern Penn-Jersey Transmission Corp., 100-million cu. ft. daily in Pennsylvania and New Jersey, $5,431,000; Kansas-Nebraska Natural Gas Co., 24-million cu. ft. daily in Nebraska, Kansas, and Colorado, $4,192,715; and Natural Gas Pipeline Co. of America, 20-million cu. ft. daily in Roberts County, Tex., $3,266,300.

•

**Japanese shipowners have been urged to reserve shipbuilding space for 1957 for their own country before most of it is booked by foreign owners, including American oil firms.**

The Japan Shipowners Assn. also has called on the government to raise the target tonnage of the Japanese merchant fleet under the current 5-year economic program.

The association estimates that under present conditions, Japanese shipyards still have capacity to accept new orders for 64 to 65 ships next year. Against this, foreign owners are rushing inquiries totaling more than 1-million gross tons.

The Japanese Trade Ministry reported last week that Japanese shipyards concluded contracts in June for 17 tankers, bringing the total since April to 25.

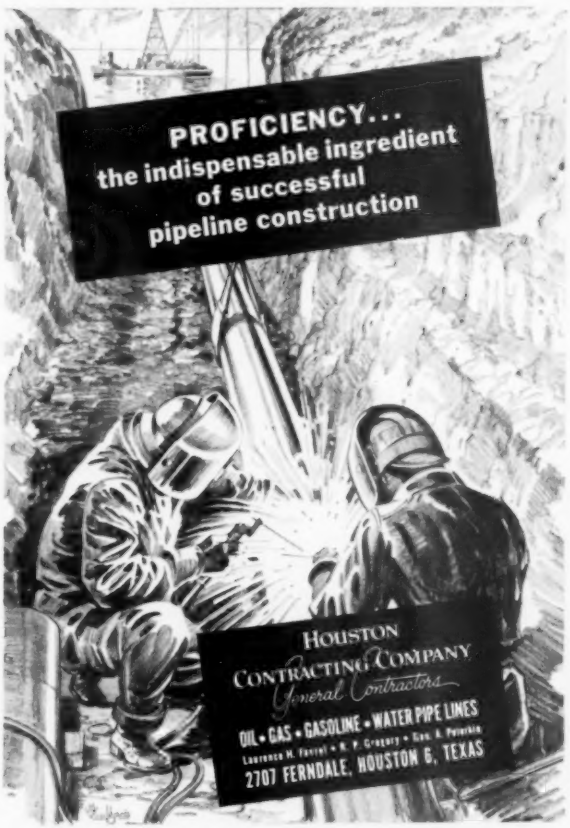
•

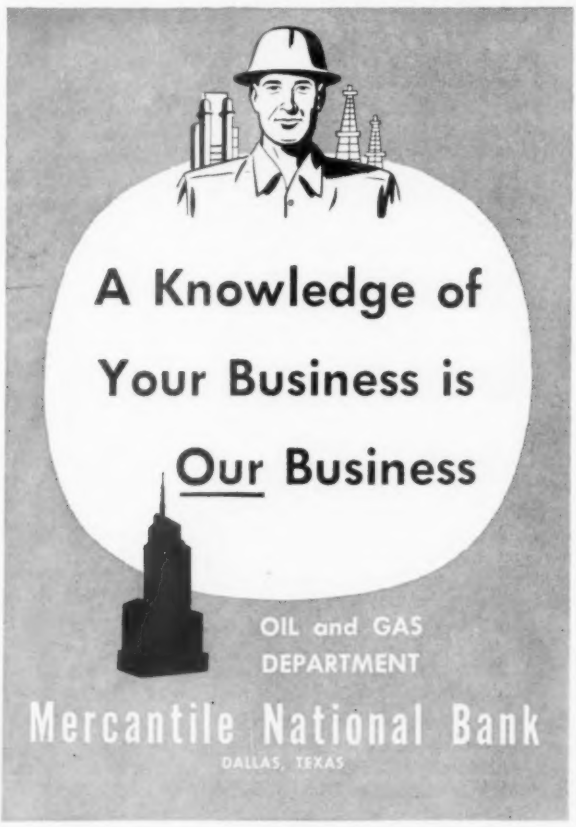
**South Saskatchewan Pipe Line Co. will begin construction next week of a 59-mi., 12-in. trunk pipeline** which will connect four oil fields in southern Saskatchewan with the Interprovincial pipeline.

South Saskatchewan received a permit from the provincial mineral resources department last week, ending a tussle with Royal Pipe Lines Co., Ltd. (PW—May25'56,p44).

The $2.9-million line will be an extension of the main pipeline system built last year from Cantaur to Regina. It will connect the Bone Creek, Gull Lake, North Premier, and Dollard medium-gravity fields. Construction is expected to be completed by late summer.

Royal's application was for a 367-mi. system from Dollard eastward to the Midale field, then north and east to connect with the Interprovincial at an estimated cost of $18-million.

# Commissions or No?

**With all its pros and cons, the company-owned station offers one thing suppliers need in troubled markets—a flexible system of retail pricing.**

**The commisson station, a long-time subject of debate among marketers, is getting renewed attention these days from major and independent suppliers alike.** National Petroleum News, a McGraw-Hill publication, says that oil marketers are taking a whole new look at the retail commission concept.

Why? Because the present marketing situation demands it.

Basically, here's how a commission (or consignment) station is run:

The dealer signs an agreement (usually for one or two years) which provides that the company keep his tanks at or near capacity. The supplier sets the retail price, and collects the sales receipts. Dealers work on a set margin (about 5¢ a gal. on gasoline). When local prices are forced down, the loss is shared by dealer and supplier. However, the company, usually provides a minimum profit margin for its commission station dealers.

Commission stations aren't new. Many oil companies started commission plans back in the lean days of the 1930s, when prospective dealers had little capital to invest. Since then, the number of commission stations has grown—but only slightly. Meanwhile, debate on the merits and demerits of the system has produced some interesting arguments:

**Primarily, suppliers favor commission stations because of their price flexibility—an important advantage in an unstable market.**

Under present law, suppliers can set retail prices in only one of two ways: by fair trading or by establishing commission stations. Supplier actions outside of these avenues that have a direct bearing on retail prices have come under attack from federal and state antitrust agencies (PW—Jul.6 '56,p12).

With commission stations in price-war areas, however, suppliers have a distinct advantage: direct control of retail prices to match the fluctuations of the market.

**And suppliers are now more concerned than ever with unstable markets.** Dealers in price-war areas, working on reduced margins, are calling on federal and state authorities periodically to "do something about oil marketing." Election-year pressure to help small businessmen could force Congress to respond. The current hotly-debated Kefauver-Rogers "anti-good-faith bill," for instance, is one possible answer.

In an effort to "do something" themselves, suppliers have moved quickly in recent months to calm troubled markets. Fair trading, an apparent success in New Jersey, is now being tried in Pennsylvania (PW—Jun.29'56,p33). And other supplier actions to help dealers—suggested price plans, and voluntary discounts—have also been increased during the past few months.

**Commission stations are also useful in setting up dealers who lack capital.** Getting good manpower is one objective of most of the plans. The shortage of men willing to enter the troubled service-station business has given oil companies a headache for some time. And some feel that commission stations are the answer.

One major company marketing executive says that a commission operator needs to invest $1 for every $2 an independent dealer invests.

The smaller investment, the official says, has attracted many men who have developed into good dealers.

Several companies use their commission stations as a place to "break in" new dealers. In this setup, a man who works out well as a commission operator is graduated to an independent dealership. Both Shell Oil Co. and Esso Standard Oil Co. run their plans in this way. Continental Oil Co. is about to do the same thing.

**Eight majors are increasing the number of their commission stations. But, on the other hand, many suppliers still refuse to touch such retail arrangements.**

There's a wide variation of opinion on the subject. It runs from "This is one thing we're going to be using more and more; it's working out well," to "We wouldn't touch it with a ten-foot pole." In the middle, you hear something like this: "We've reviewed the idea at a high level. There's nothing in it for us."

**Commission-plan dissenters say that the plans are legally hazardous, and economically impractical. And they contend that commission dealers simply don't have the incentive of indepent dealers.**

Right now, the government's thoughts on commission stations are not unfavorable. Some Justice Dept. officials regard the stations as a possible solution to the problem of avoiding price discrimination charges under the Robinson-Patman Act. And Federal Trade Commission lawyers seem to agree.

But neither DJ nor FTC has given commission stations an unqualified O.K. Some government lawyers have talked of possible illegality in stations which sell only some of their products on commission, and in those which

## Who Is Using Commission Stations

| Company | Total Stations | Commission Stations | Products Consigned |
|---|---|---|---|
| Atlantic | 8,400 | 429 | Gasoline |
| California Standard | 8,100 | 50-100* | All |
| Cities Service | 16,700 | 42 | Gasoline |
| Esso Standard | 25,000 | 154 | Gasoline, Motor Oils |
| Gulf | 36,400 | 500* | Gasoline |
| Humble | 2,200 | 350-400* | All |
| Indiana Standard | 17,000 | 25-30* | Gasoline |
| Kerr-McGee | 950 | 8 | Gasoline |
| Shell | 23,100 | 1,021 | Gasoline |
| Sun | 6,800 | 1,200 | Gasoline |
| The Texas Co. | 38,500 | 30 | Gasoline |
| Union of California | 5,000 | 3,000 | Gasoline |

*Estimate

Data—National Petroleum News

are bounced on and off the commission basis periodically.

With the legal climate hazy, several companies are frankly unwilling to risk new tangles with the government. "It's hard enough to live right as it is," says one marketing manager. "Why make it harder?"

Suppliers are critical on other points too. For one thing, consigning products means more bookkeeping. They see it as a costly drag on operations already topheavy in bookkeeping and internal auditing controls. And establishing retail prices means extra work to evaluate market conditions, hiking operating costs even further.

There is also some question of the comparative efforts of a dealer "working for himself" and one "working for the company" on a commission plan.

Suppliers without commission plans say that, all other things being equal, the independent dealer will outhustle the consignee dealer. And more sales and profits for the dealer, they point out, mean more profits for his supplier.

**Dealer groups oppose commission station plans—violently.** The National Congress of Petroleum Retailers is leading the fight against the plans. It says that such agreements are a "step backwards in the supplier-dealer relationship."

# What's New / IN MARKETING

## Marketers Unite To Fight S-11

**Testimony from a united front of oil marketers—major suppliers, small refiners, jobbers, and even a dealer representative—has swayed much Senate opinion against the "anti-good-faith" bill. But the bill still appears hard to stop.**

At least seven senators are reported to be withdrawing from cosponsorship of the bill, as a result of recent committee hearings.

James W. Ross, assistant general manager of sales for Standard Oil Co. (Ind.), attacked the bill as "an anti-consumer bill, a carefully rigged device for preventing price competition in the open marketplace."

Ross also accused spokesmen for the National Congress of Petroleum Retailers of "having indulged in extravagant distortions of the facts" in their testimony before the committee.

Donald O'Hara represented the National Petroleum Assn. and the Western Petroleum Refiners Assn. at the hearings. He told the committee that, "if you are interested in preserving, for the public, genuine competition among suppliers, I think you can do it only by giving these independent companies an opportunity to meet competition when and where they find it."

Otis Ellis, general counsel of the National Oil Jobbers Council, said that the legislation would "impose such perils on large and small refiners that jobbers would be eliminated."

Maurice Fager, Standard Oil Co. (Ind.) dealer, told the committee that "with price cutters selling gasoline up to 6¢ a gal. off, I would go broke pretty soon unless I received some help to tide me over the price war period."

Opponents of the bill are hoping it is bottled up in committee because passage is still likely if it gets to the Senate floor. They got encouragement Monday when the full Senate Judiciary Committee put off discussion of the bill.

•

**City Products Corp., of Chicago, has just become an integrated supplier.** City Products has bought up the refining, pipeline, and marketing facilities of Premier Oil Refining Co., long-time southwestern independent. City Products has its own southwestern oil and gas production.

Three small refineries and 700 service stations—scattered throughout Texas—are included in the deal. The refineries are at Baird (2,600 b/d), Ft. Worth (7,500 b/d), and Longview (4,500 b/d). The Premier brand will be retained at all stations. According to Premier's president R. P. Hargis, "Premier's existing policies with respect to all operations, including crude purchasing, pipelines, refining, and marketing will be continued."

•

**Gulf Oil Corp. will market a new detergent aviation oil for use in all types of aircraft engines.** The new oil, which will be available in three viscosity grades, is a blend of Gulf's processed stocks, an anti-foam agent, and a detergent dispersant. Gulf says that the oil will be suitable for use in both horizontally opposed and radial engines.

•

**A second battery-additive manufacturer has been cleared of false advertising charges by the Federal Trade Commission.** Charges against Courant Distributing Co., maker of "Sav-a-Battery," were dropped last week, when FTC ruled that no reliable, probative, and substantial evidence of record" could be found against Courant's advertising pitch. Courant's ads say that "Sav-a-Battery" will lengthen the life of automobile batteries.

FTC recently dismissed similar charges against makers of another battery additive, AD-X2 (PW—May25 '56,p39).

•

**Shell Oil Co. is going to revise its credit card system this fall.** Late in October, Shell will install automatic imprinters at its service stations to give speedier service for the 37-million credit transactions the stations handle annually. Shell is adopting the new imprinters after a three-month test period in the New York City area. Atlantic Refining Co. recently installed similar imprinters at its stations (PW—Mar.23'56,p28).

•

**Bus consumption of LP-Gas products has risen from 17.8-million gal. in 1952 to 28.5-million gal. in 1955,** according to the Petroleum Gas Assn. The association says that butane and propane powered 2,052 buses last year for a total of 79-million miles. And bus-company demand for LP-Gas is expected to keep growing in 1956: some 320 more LP-Gas-burning buses will be put into use this year.

•

**Ashland Oil Co. is strengthening its Cleveland marketing setup. It has just bought 33 service stations there, and is looking to get more.**

Most of the new stations have been marketing Ashland products—but under their own brands. Now they'll all fly the Ashland banner. Although Ashland isn't aiming at a set quota of Cleveland stations, it is known to be interested in buying or building more stations there. The company is announcing its Cleveland marketing expansion through a big new promotion campaign. Newspaper, radio, television and billboard ads will be used to do the job.

# The Market Place AROUND THE WORLD

Prices compiled for PETROLEUM WEEK by Platt's OILGRAM Price Service and National Petroleum News, McGraw-Hill Publications

All Prices as of July 9

Bold face type indicates changes from previous week

## KEY PRICES—REFINED PRODUCTS

(¢ per gal. except dollars per bbl. where $ is shown)

### Western Hemisphere

**U. S. Gulf Coast, Cargoes**
- Gasoline, 98 oct prem....13.25-13.75
- Gasoline, 92 oct reg....11.5-12
- Kerosine....9.5-9.75
- Heating oil, No. 2....8.75-9.5
- Gas oil, 48-52 d.i....9.125-9.375
- Fuel oil, bunker "C"....$2.10-2.15

**Caribbean, cargoes**
- Avgas, Grade 100/130....16.75
- Gasoline, 93 oct research prem....11.75
- Gasoline, 87 oct research reg....10.5
- Gasoline, 79 oct research....9.75
- Gasoline, 70-72 oct motor method....9.5
- Kerosine....9.5
- Heating oil, No. 2....8.75
- Gas oil, 48-52 d.i....9.125
- Fuel oil, bunker "C"....$2.10

**New York Harbor, barges**
- Kerosine....10.85
- Heating oil, No. 2....10.35
- Fuel oil, No. 6....$2.80

**Okla.-Group 3, northern shpt, bulk**
- Gasoline, 88 oct reg....11.75-12
- Kerosine....10-10.25
- Heating oil, No. 2....8.875-9.5
- Fuel oil, No. 6....$2.00-2.20

**Chicago, bulk**
- Gasoline, 91 oct reg....13-13.25
- Heating oil, No. 2....10-11.1
- Fuel oil, No. 6, high sulfur....7.7-8.05

**Los Angeles, rack**
- Gasoline, 84 oct reg....12.9-13
- Diesel fuel, PS 200....9-9.8
- Light fuel, PS 300....$2.65
- Heavy fuel, PS 400....$2.15-2.25

**Natural Gasoline, Grade 26-70**
- FOB Group 3....4.5
- FOB Breckenridge, Tex....4

**LP-Gas—Propane**
- Oklahoma (Group 3)....4.5

**Penna Lubes**
- Bright stock, 25 p.t....26
- 200 vis. neutral, 25 p.t....23

**Mid-Continent Lubes, Tulsa basis**
- Bright stock, solvent 95 v.i....24-25
- Neutral, solvent 200-210 vis....19.75-20.75

**Gulf Coast Lubes**
- Bright stock solvent, 95 v.i....25
- Neutral, solvent, 200 vis....21.5

### Eastern Hemisphere

**Singapore, cargoes**
- Avgas, Grade 100/300....18.375
- Gasoline, 79 oct research....10.5
- Gasoline, 70-72 oct motor method....10.25
- Kerosine....10.125
- Gas oil, 48 d.i. minimum....9.75
- Fuel oil, light....$3.30

## KEY PRICES—CRUDE OIL

(2¢ differential per deg. of grav. applies except as noted)

### Western Hemisphere

**United States (at the well)**
- Mid-Continent, 36.0-36.9....$2.82
- North Dakota, 36.0-36.9....2.82
- Texas:
  - G. Coast, low cold test, 26.0-26.9....2.95-3.05
  - Gulf Coast, upper and lower, 26.0-26.9....2.82
  - West Texas sweet, 36.0-36.9....2.82
  - West Texas-New Mexico intermediate, 36.0-36.9....2.75
  - West Texas-New Mexico sour, 32.0-32.9....2.61
  - East Texas, flat price....2.90
  - **Mirando, 28.0-28.9....3.11↑**
- Illinois Basin, flat price....2.90
- Penna Grade, Bradford dist, flat price....4.45
- California, Signal Hill, 21.0-21.9....2.41†
- North Louisiana-Arkansas, 36.0-36.9....2.82
- Wyoming sweet, 36.0-36.9....2.75
- Wyoming sour, 32.0-32.9....2.48

**Canada (flat prices, at the well)**
- Acheson-Stony Plain (Alta.) D-2, D-3, L. C....2.54
- Leduc-Woodbend (Alta.) D-2, D-3....2.60
- Redwater (Alta.) D-3....2.49
- Daily-Mississippian (Man.)....2.34
- Smiley-Viking (Sask.)....2.26

**Venezuela (Cargoes, FOB lifting port designated)**
- Cumarebo, 48.0-48.9, Tucupido....3.40
- San Joaquin, 41.0-41.9, Puerto la Cruz....3.04
- Oficina, 35.0-35.9, Puerto la Cruz....2.80
- Tia Juana Medium, 26.5-26.9, Amuay....2.30*
- Bachaquero, 16.5-16.9, Amuay, Las Piedras....1.90**
- Tarra, 38.0-38.9, Cardon....2.91
- Lagunillas Heavy, Amuay, Cardon, Las Piedras, flat price....2.05

*Differential per ½ deg. grav.: (*) 2.5¢ bbl. (**) 3.5¢ bbl.*
*†Differential per deg. of grav. varies.*

### Eastern Hemisphere

**Middle East, Persian Gulf (Cargoes, FOB lifting port)**
- Arabian, 36.0-36.9, Ras Tanura....1.97
- Basrah, 32.0-32.9, Fao....1.79
- Iranian, 34.0-34.9, Bandar Mashur....1.91
- Iranian, 34.0-34.9, Abadan....1.86
- Iraq, 36.0-36.9, Fao....1.87
- Kuwait, 31.0-31.9, Mina-al-Ahmadi....1.72
- Qatar, 39.0-39.9, Umm Said....2.06

**Middle East, Eastern Mediterranean**
- Arabian, 36.0-36.9, Sidon....2.46
- Iraq, 36.0-36.9, Tripoli, Banias....2.46

**Far East, (Cargoes, FOB Lutong, Sarawak)**
- Seria Light, 37-38....2.60

## KEY TANKER RATES

(Last paid, per long ton, single voyage)

U.S. Gulf-New York, clean....(USMC +70%) $4.85[1]

**U. S. Gulf-N.Y., dirty....(USMC +60%) $4.56↑[2]**

**NWI-USNH, dirty....(USMC +45%) $3.92↓[3]**

**NWI-UK/Cont., dirty....(Scale +80%) 58/6*↓**

Pers. Gulf-UK/Cont., dirty....(Scale+112½%) 17/10*

**Pers. Gulf-USNH, dirty (USMC +37½%) $17.46↓**

**Sterling Owners asked: (1) $5.13/5.42 (USMC +80/90%); (2) $4.70/4.99 (USMC +65/75%); (3) $3.92/4.05 (USMC +45/50%).*

# The Market Trend

This page will be perforated from now on so that you can tear it out and file it if you wish.

## Old Buyers Sometimes Fade Away, Too

**When buyers back away, sellers rush in.** This economy-of-surplus impulse came into play in several deals—and projected deals—last week.

**Several Canadian buyers backed off fast. They suddenly decided to forget about the No. 2 fuel they had on order this season in the Caribbean and the U. S. Gulf.** They pulled away because they couldn't see paying USMC +70% for spot tanker voyages. But Midwest refiners were waiting in the wings—and rushed in with offerings of No. 2 at about 9.75¢ f.o.b. The upshot: About 1-million bbl. of No. 2 were sold from Great Lakes ports for barge shipment to points in Ontario.

**Steel companies were backing away, too.** They cut back on purchases of low-sulfur bunker oil as soon as the nationwide strike began. Spot transport sales in Chicago fell off to nothing. Oklahoma refiners were pushing 1% sulfur No. 6 at 20¢ and 30¢ discounts. Three cargoes of this special-use fuel showed up at the Gulf.

**And sometimes all a buyer has to do is play a waiting game to flush out a seller.** Word is leaking out that a Middle East supplier may furnish much of the crude for a 55,000 b/d refinery planned in the Canal Zone (PW—May25'56,p37). If the deal jells, it will mean that a seller at a distance of 9,500 mi. will pick up business from under the noses of two big producers 1,500 mi. from Panama—the U. S. and Venezuela.

**When the Therm Turns:**

The coal-to-oil shift in Europe is calling for lots of tankers. And this big energy change has brought on a new philosophy of growth among international oil companies.

Time was when big oil companies used to order tankers only after they landed a new account. Now they're ordering ships on the premise that the coal-to-oil switchover will provide future business—even though it isn't yet in hand.

**Turnpike Terminals:**

The multibillion-dollar road program will change the face of oil markets. Notice already how recently built terminals in the East have been spotted at points like Edgewater and Pennsauken, N. J., Rochester and Catskill, N. Y.

All of these terminal locations have two things in common: They're on water to bring in oil the cheapest way; and they're close to highway interchanges to get oil to the customer the fastest.

**Gasoline:**

Gasoline may have passed its peak as far as heavy buying is concerned. There's no distress product in the market at the Gulf—not yet. But regular-grade can be picked up at 0.25¢ to 0.375¢ discounts.

**Lubes:**

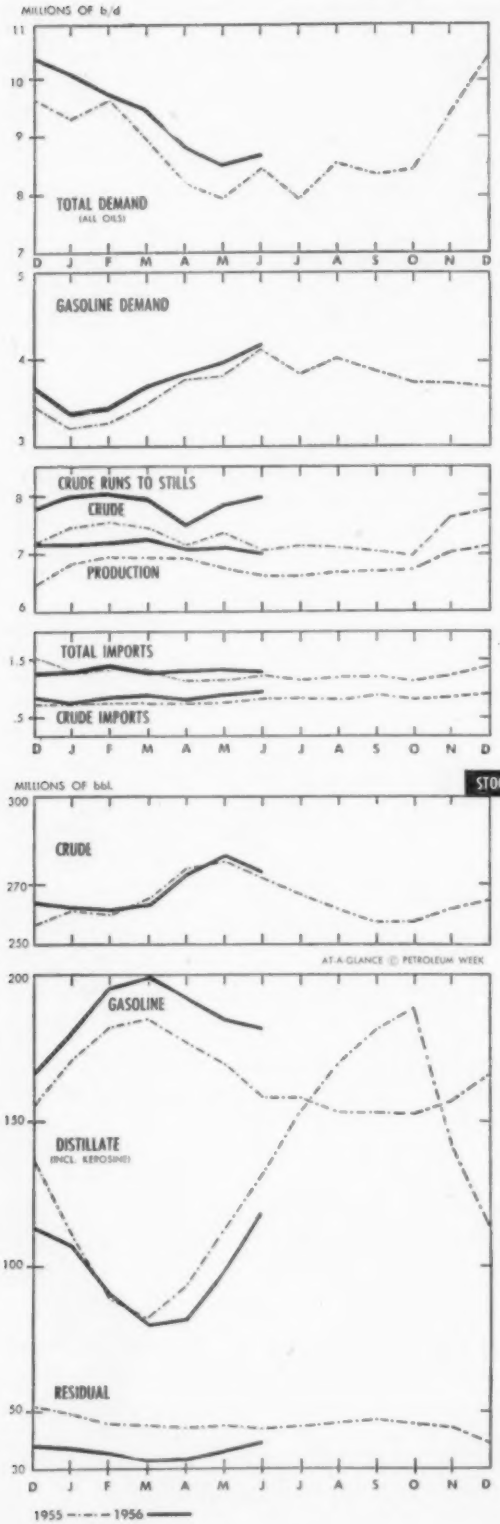
Prices were firm on recent offerings to Argentina: 25¢ for solvent bright stock and 23.5¢ for 500 solvent neutral, f.o.b. ship at the Gulf.

**Crude:**

There's no weakness in Venezuelan crudes. One buyer is in the market for several cargoes, fourth quarter lifting, with no coverage as yet.

PETROLEUM WEEK'S

# Fingertip Figures




**TOTAL DEMAND**

| | |
|---|---|
| Latest 4-week average | 8.653 |
| Year ago | 8.217 |

**GASOLINE DEMAND**

| | |
|---|---|
| Latest 4-week average | 4.238 |
| Year ago | 4.056 |

**RUNS TO STILLS**

| | |
|---|---|
| Latest week | 7.974 |
| Previous week | 8.144 |
| Year ago | 7.646 |

**CRUDE PRODUCTION**

| | |
|---|---|
| Latest week | 7.086 |
| Previous week | 7.034 |
| Year ago | 6.597 |

**TOTAL IMPORTS**

| | |
|---|---|
| Latest week | 1.426 |
| Previous week | 1.246 |
| Year ago | 1.241 |

**CRUDE IMPORTS**

| | |
|---|---|
| Latest week | 1.032 |
| Previous week | .871 |
| Year ago | .929 |

**CRUDE STOCKS**

| | |
|---|---|
| Week ended 6-30 | 274.7 |
| Previous week | 275.6 |
| Year ago | 270.8 |

**GASOLINE**

| | |
|---|---|
| Latest week | 178.5 |
| Previous week | 181.4 |
| Year ago | 189.8 |

**DISTILLATES**

| | |
|---|---|
| Latest week | 125.0 |
| Previous week | 119.5 |
| Year ago | 135.7 |

**RESIDUAL**

| | |
|---|---|
| Latest week | 39.8 |
| Previous week | 38.4 |
| Year ago | 45.3 |

**A long steel strike could hit a body blow to third quarter demand for oil. And unless such possible reductions are offset in the fourth quarter, total demand for 1956 could run below recently revised estimates.**

Oil economists this week are trying to figure out if the strike may boost sagging gasoline demand. One big hope is that vacation driving by furloughed employees might (1) make up for the low gasoline demand in June, and (2) offset fuel oil demand that may be "lost" because of closed plants.

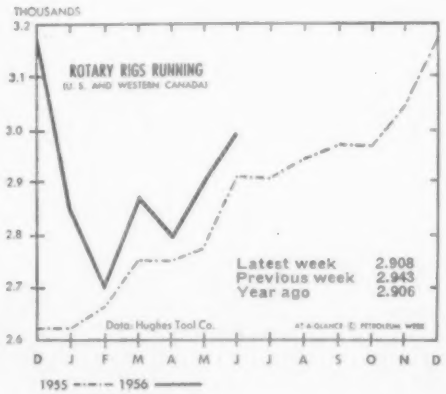
**The immediate concern is over a possible serious oversupply in the third quarter in view of the 124,000 b/d stock buildup in the first half.**

Demand reached a new high of 9.2-million b/d in the first half, but new supply was even higher. It resulted in a stock buildup of four times the rate of the first half of 1955.

The biggest part of the inventory accumulation came in June, averaging 623,000 b/d. It resulted from (1) too much domestic production, (2) an unusually high import volume, and (3) a lower-than-expected demand, particularly for gasoline (charts).

**The outlook definitely requires reductions in domestic production and imports, at least for the remainder of the third quarter.**

Good indications of the major crude purchasers' views are expected to come next Thursday at the Texas Railroad Commission's hearing for August allowables. There is even a possibility some requests may be made for a cutback for the remainder of July. And even with a 4% cutback, third quarter imports may be too high.


THOUSANDS
ROTARY RIGS RUNNING
(U. S. AND WESTERN CANADA)
Latest week 2.908
Previous week 2.943
Year ago 2.906
Data: Hughes Tool Co.
AT-A-GLANCE © PETROLEUM WEEK
D J F M A M J J A S O N D
1955 1956

**ROBERT L. KIDD** has been named president of Cities Service Oil Co. (Del.), and **J. E. Heston** succeeds him as president of Arkansas Fuel Oil Corp., the company's Shreveport subsidiary. Kidd joined Cities Service in 1925 as a geologist, and was later named chief geologist and vice-president of oil and gas production and exploration. In 1953, he was elected president of Arkansas Fuel Oil Corp., and two of its subsidiaries. Heston has been with Cities Service since 1930. He became manager of the company's oil production department in 1951. In 1954, he was named vice-president and a director of the parent company.

**ROBERT W. PACK**, director of production and a director of Sun Oil Co., is retiring after 39 years with the company. Pack joined Sun in 1917 as a geologist, and later became chief geologist. In 1920 he became general manager of Sun's Gulf Coast division, and vice-president and general manager of Sun Pipe Line Co. (Texas). He was named a director of the parent company in March, 1947, and eight months later became director of Sun's production activities.

**FREDERICK P. HAGAMAN** has been named controller of Esso Standard Oil Co. Hagaman has been Esso Standard's executive assistant controller since 1945, when Standard Oil Co. of Louisiana became a subsidiary of Esso. He succeeds **Harold A. Koechling**, who will now devote full time to his duties as a member of Esso's board of directors.

**ROBERT O. WYNN** has been elected vice-president of manufacturing of W-K-M Mfg. Co., Houston. He was formerly director of manufacturing of W-K-M's ACF valve division.

**WILBURN T. ASKEW** has been elected president of Sun Oil Co., Ltd., Canada. Askew was formerly manager of Sun Oil Co.'s Marcus Hook (Pa.) refinery. He joined the Sun organization in 1931 as a chemical engineer at Marcus Hook. He was later named general foreman of the alkylation and gas division there, and rose to assistant superintendent, superintendent, assistant manager, and in 1954, manager of the refinery.

**ARTHUR M. SHERWOOD** has been named secretary of Socony-Mobil Oil Co. He succeeds **William D. Bickham**, who is retiring after 27 years of service. **James J. McKay** and **Jean Lutz** have been named assistant secretaries of the company, succeeding Sherwood and **Paul J. Buttles**, who is retiring after 29 years with the company.

**LESTER B. SWAN**, general manager of Dow Chemical Co.'s Brazos Oil & Gas Division, has been elected a director of Dowell Inc. Swan joined Dowell in 1940 as a junior engineer, and in 1947 was named manager of the company's New Orleans district. In 1953, he transferred to Brazos, and was named general manager in 1955.

**L. L. BYARS** will manage the gas division of Skelly Oil Co., at Tulsa. He will be in charge of selling gas for the company's production department, and buying and selling gas for its manufacturing department. Byars was formerly in charge of gas purchases and sales for Skelly's gasoline plants. **Edward H. Moores** will assist Byars. Moores was formerly in Skelly's legal department.

**DR. C. W. SMITH** has been named technical assistant to the president of Shell Development Co., at New York. He was formerly assistant head of the company's plastics and resins department at the Emeryville (Calif.) research center. He succeeds **Dr. F. M. McMillan.**

**J. T. (Tommy) TUCKER** has been named general sales manager for Cardwell Mfg. Co., Wichita (Kan.) manufacturers of oilwell drilling and servicing equipment. Tucker was formerly vice-president of sales for George E. Failing Co., at Enid, Okla.

**A. BRUCE BOEHM** has been elected executive vice-president of Enjay Co., Inc., New York marketer of petrochemicals. Boehm joined Enjay in 1947 as sales manager of the company's paraffins division. In 1954 he was elected a vice-president and sales manager of the butyl rubber division. **Willard F. Wadt** has been named manager of Enjay's new central sales division at Chicago.

**BENNIE STEPHENS**, Stanolind Oil & Gas Co., has been elected president of the Midland Oil Scouts Assn. Other new officers are: **Charles Perry**, Magnolia Petroleum Co., first vice-president and bull scout for south district; **Morris Howell**, The Chicago Corp., second vice-president and bull scout for north district; **H. L. Pyeatt**, Phillips Petroleum Co., secretary-treasurer.

**LESTER W. HALL** has been elected executive vice-president of Eastman Oil Well Survey Co., Denver. Hall was formerly Eastman's financial adviser.

**LEROY KIRKPATRICK** has been appointed secretary-treasurer and **Mrs. Jamiece Rollow**, assistant secretary, of Alex W. McCoy Associates, Inc., Tulsa. Reelected officers are: **Alex McCoy**, president, **C. A. Mortiz**, executive vice-president, and **Robert Storch** and **J. M. Ewers**, vice-presidents.

**C. L. BARKER**, E. I. du Pont de Nemours & Co., has been elected president of the Denver Geophysical Society. Other new officers are: **R. C. Kendall**, Shell Oil Co., vice-president; **R. R. Parks**, The Chicago Corp., secretary-treasurer; and **Ardis Haig**, Phillips Petroleum Co., district representative.

**LOWELL M. WILHOIT** has been appointed vice-president in charge of engineering for Otis Engineering Co., Dallas. He was formerly vice-president in charge of sales and services for Otis Pressure Control, Inc., an affiliate of Otis Engineering. **James E. McGinley**, former person-

# CLASSIFIED

DISPLAYED RATE

The advertising rate is $12.60 per inch for Equipment and Business Opportunity advertising appearing on other than a contract basis. Contract rates quoted on request.
Employment opportunities—$14.80 per inch, subject to Agency Commission.

UNDISPLAYED RATE

$1.50 a line. Minimum 3 lines. To figure advance payment count 5 average words as a line. (See ¶ on Box Numbers.)
POSITION WANTED. Undisplayed rate is one half of above rate, payable in advance.
PROPOSALS, $1.50 cents a line an insertion.

INFORMATION

BOX NUMBERS count one additional line in undisplayed ads.
NEW ADVERTISEMENTS accepted 16 days prior to issue date.

## CHEMICAL ENGINEER

Excellent opportunity with a West Coast Independent Oil Company (San Joaquin Valley). Refinery Experience, Process Design and Operation essential. Must have Engineering Degree. Salary commensurate with ability and experience. Reply outlining personal history, photograph and work background.

**P-2290 PETROLEUM WEEK**
**68 Post St., San Francisco 4, Calif.**

## TANKS FOR SALE

Offers entertained for purchase of Four 150,000 barrel welded cone roof oil storage tanks, 150 x 48 feet, constructed to API Standard 12C less than 7 years ago.

Available July 1, 1956

***For Details, Contact***
**LAKEHEAD PIPE LINE COMPANY, INC.**
**2206 East 5th Street**
**Superior, Wisconsin**
**EXport 8-3511**

SPECIAL SERVICE

Contact A. L. Bowles, Box 947, Ada, Okla., for Drilling deals, oil production.

## PROFESSIONAL SERVICES

**MACCO CORPORATION**
Engineering, Design, Drafting, Construction, Process Engineering for Petroleum Refineries, Chemical and Petro-Chemical Plants.
**ADDRESS: REFINERY AND CHEMICAL DIVISION, 14409 So. Paramount Blvd., Paramount (Los Angeles), Calif. Phone: NEvada 6-1261**

**JAMES P. O'DONNELL**
***Consulting Engineer***
Professional Engineering for the Petroleum and Process Industries
39 Broadway, New York 6, N. Y.
Beaumont, Texas Tulsa, Oklahoma


nel director for Otis Engineering, has been transferred to Otis Pressure Control as director of sales and service. **Kenneth W. Robbins,** former service manager, has been named to a new position of director of export department sales and service.

**C. HARRISON COOPER** has been elected executive vice-president and a member of the executive committee of Ambassador Oil Corp. He succeeds **Luther Hudson,** who has resigned.

**RUSSELL E. WATSON, JR.,** is the new executive secretary of the New York Petroleum Industries Committee. He succeeds **E. D. Cray,** who is retiring.

**E. D. McELVAIN** will manage Phillips Petroleum Co.'s Washington (D. C.) office. McElvain was formerly director of the industrial development division of Phillip's natural gas department. He succeeds **R. C. Jopling** who is retiring.

**JOHN DIAL,** southeastern division manager of Pure Oil Co., has been named chairman of the Georgia Petroleum Industries Committee. Dial succeeds **G. Everett Millican,** Gulf Oil Corp.

**H. S. SPARROW** has been appointed general manager of the crude and products supply department of British-American Oil Co., Ltd. Sparrow was formerly assistant manager of the company's Montreal East refinery. **L. G. May** will manage production for B-A's production department at Calgary, Alta. **E. J. Gallagher** has been named assistant general manager, and **O. W. Wall** has been named assistant production manager of the production department. **J. H. Manning** will manage exploration for Saskatchewan and Manitoba, at Regina, Sask.

**WILLIAM H. FLOOD, JR.,** will manage production for Northern Natural Gas Producing Co., Omaha. Flood was formerly Guymon-Hugoton (Kan.) district superintendent for Republic Natural Gas Co.

# ADVERTISERS IN THIS ISSUE

*This index is published as a convenience. Every care is taken to make it accurate, but* PETROLEUM WEEK *assumes no responsibility for errors or omissions.*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| Dowell Inc. | 4 |
| First Nat'l Bank in Dallas | 2nd Cover |
| General Refractories Co. | 35 |
| Houston Contracting Co. | 39 |
| Houston Technical Labs | 17 |
| Lone Star Steel Co. | 20 |
| Mercantile Nat'l Bank of Dallas | 39 |
| National Aluminate Corp. | 7 |
| Procon Inc. | 36 |
| RCA Communications Prods. | 3rd Cover |
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## PETROLEUM WEEK REPRESENTATIVES


**Atlanta 3** R. H. Powell, Jr.
801 Rhodes-Harverty Bldg.
Walnut 5778

**Boston 6** Edward A. Callahan, Jr.
350 Park Square Bldg.
Hubbard 2-7160

**Chicago 11** G. L. Hackley, Jr.
W. F. Holbrook
520 North Michigan Avenue
Mohawk 4-5800

**Cleveland 15** J. E. MacArthur
1510 Hanna Bldg.
Superior 1-7000

**Houston 25** David G. Sawyer
724 Prudential Bldg.
Jackson 6-1281

**Los Angeles 17** Peter S. Carberry
1125 W. Sixth St.
Madison 6-9351

**New York 36** Edward A. Callahan, Jr.
Donald R. Thompson
330 West 42nd Street
Longacre 4-3000

**Philadelphia 3** W. A. Potter
Architects Building
Rittenhouse 6-0670

**San Francisco 4** William C. Woolston
68 Post Street
Douglas 2-4600

**Tulsa 19** J. A. Hartley
209 Constantine Bldg.
601 South Boston
Gibson 7-5594

**England, London E.C.4** Herbert Lagler
McGraw-Hill Co., Ltd.
95 Farrington St.

# Other Oil Industry Personnel Changes:

| Company: | To: | From |
|---|---|---|
| **British-American Oil Co.** | | |
| Alex Boardman | Producing staff, Denver | Consulting geologist, Denver |
| **Byron Jackson Tools, Inc.** | | |
| J. P. Magoffin | Mgr, new product sales, Los Angeles | |
| **Commerce Oil Corp.** | | |
| Alfred Brown | Mgr, sales, trading, New York | V-p, Hudson Oil Co., New York |
| **Continental Oil Co.** | | |
| John Cagle | Geologist, Houston | Geologist, Bakersfield |
| Howard Semler | Geologist, Ardmore, Okla. | Geologist, Bakersfield |
| Bill Osborn | Geologist, Los Angeles | Geologist, Bakersfield |
| **Continental Supply Co.** | | |
| Warren A. Pratt | Store mgr, Red Deer, Alta. | Store mgr, Liberal, Kan. |
| **El Dorado Refining Co.** | | |
| Franz P. Neumann | Mgr, supply, distribution, El Dorado, Kan. | Asst traffic mgr, El Dorado |
| **General Petroleum Corp.** | | |
| L. E. Bourquin | Mgr, commercial sales, Los Angeles | Mgr, San Mateo (Calif.) marketing div. |
| Paul R. Nilsson | Area sales mgr, Los Angeles | Dist sales mgr, Los Angeles |
| J. A. Simpson | Area sales mgr, San Francisco | Dist sales mgr, South Coast, dist, Calif. |
| **Geolograph Service Corp.** | | |
| E. L. Ross | Mgr, Grand Junction (Colo.) office | |
| **Houdry Process Corp.** | | |
| Dr. Adalbert Farkas | Section chief, exploratory research, Linwood (Pa.) laboratory | |
| **Houston Oil Field Materials Co.** | | |
| R. M. Stuard | Dist mgr, Hattiesburg, Miss. | |
| W. H. Griffin | Store mgr, Hattiesburg | |
| **McCullough Tool Co.** | | |
| George H. Echols, Jr. | Houston dist sales mgr. | Sales eng, Beaumont |
| T. H. (Tommy) Farmer | Northern New Mexico dist mgr, Aztec | Sales mgr, West Texas dist, Midland |
| **Shell Oil Co.** | | |
| Lee Holcomb | Exploration dept, Casper, Wyo. | R. Stanley Beck, Bakersfield |
| **Socony-Mobil Oil Co.** | | |
| William W. Richardson | Asst comptroller, New York | Secretary, coordination comm., New York |
| Warren M. Albert | Asst comptroller, New York | Asst to v-p, Magnolia Petroleum Co. |
| Stuart W. Thomson | Asst mgr, Paulsboro (N. J.) refinery | Paulsboro refinery |
| **Southwest Grease & Oil Co.** | | |
| Wilson Simmons | Sales mgr, Wichita, Kan. | Special territory rep |
| **Sun Oil Co.** | | |
| John W. Timmins | Special counsel, prod dept, Dallas | Gen attny, southwest div, Dallas |
| Martin A. Row | Gen attny, southwest div, Dallas | Asst gen attny, southwest div, Dallas |
| Edwin Cage | Asst gen attny, southwest div, Dallas | |
| **Sunshine Mining Co., Petroleum Div.** | | |
| Ernest S. (Bill) Wells, Jr. | Div mgr, Denver | |
| Nolan L. Ashburn | Div geologist, Denver | |
| George Geor | Div prod supt, Denver | |
| **Texas Co.** | | |
| R. E. Wright | Staff pet eng, New York | Pet eng, Houston |
| **Tex-Penn Oil & Gas Corp.** | | |
| W. S. Ryan | Pet eng, Corpus Christi | Prod eng, Carter Oil Co., Shreveport |
| **Tidewater Oil Co.** | | |
| E. J. Preston | Div products supervisor, New York | Employee rel supervisor, marketing dept, New York |
| **U. S. Steel Corp., Oil Well Supply Div.** | | |
| Otha V. Coke | Asst dist eng, machine, equipt sales, Liberal, Kan. | Oklahoma City office |
| **Welex Jet Services, Inc.** | | |
| William Robert Shepard | Sales eng, Great Bend, Kan. | |
| Sammy D. Pierce | Sales eng, Bartlesville, Okla. | Rigger, jr. shooter, Bartlesville |
| **Western Gulf Oil Co.** | | |
| T. I. Anderson | Geologist, Bakersfield | Geologist, Santa Maria, Calif. |
| **Wilson Supply Co.** | | |
| Maurice Stack | Dist mgr, Midland | Store mgr, Corpus Christi |
| **New Ventures—** | | |
| Howard H. Odiorne, Robert J. Munn | Clover Petroleum Co., Denver (exploration) | |
| Robert D. Hendrickson | Consulting geologist, Corpus Christi | V-P, chief geologist, Highland Oil Co. |

# A Lesson from Capitol Hill

THE OIL INDUSTRY can learn an important lesson from the course of the battle in Congress over the Kefauver-Rogers bill. It's a lesson that can be profitably applied in the future. In essence, it calls for realization that the man in the best position to influence public opinion is the retailer.

It is important, therefore, to gain the dealer's support—or at least his understanding—of measures affecting the entire industry.

SMALL REFINERS, jobbers, and major oil companies all opposed the Kefauver-Rogers bill, which makes it hazardous to offer one customer a lower price than another—even in good faith to meet a competitor's price. Both the refiners and the jobbers know this legislation won't automatically help small businesses compete against their larger brethren, as its proponents claim. In fact, some refiners and jobbers say it will put them out of business because it will rob them of their most prized asset: their ability to move fast in a shifting market.

Nevertheless, members of both the House and the Senate have been bombarded with telegrams favoring the bill from gasoline dealers acting under the leadership of the National Congress of Petroleum Retailers. Yet this has aroused no talk on Capitol Hill about "pressure propaganda," no outcry against "selfish lobbies."

The reason is obvious. Gasoline dealers, and the druggists and food retailers who have joined them in the campaign for the measure, are "small businessmen." To the politician facing a reelection campaign, that is all he needs to know. He simply acts on the theory that there are more little people in his home district than big people. Everybody has to be for "small business."

If gasoline retailers can swing this kind of political weight for a bill which most of the oil industry thinks is bad, they can swing the same kind of weight for legislation favored by the rest of the industry.

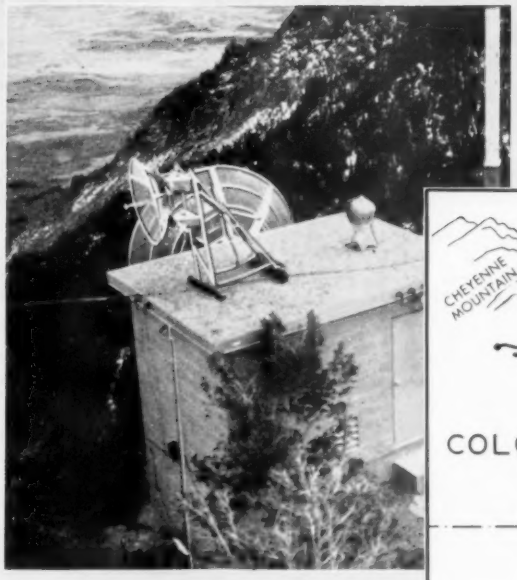
Many oil men know that the service station dealer is a key man in oil's public relations. That fact was brought out in PETROLEUM WEEK's Special Report, "Public Opinion and Your Future" (PW—May11'56, p27; May18'56,p37). Gaining the dealer's sympathetic support is a major undertaking in itself—but it must be done. This need already is recognized by the Oil Industry Information Committee; it's the basis of OIIC's "key dealer" plan.

DEALERS ARE in a perfect position to offset the real Achilles' heel of the oil and gas industry: its regional identification. Major production of petroleum is restricted to a handful of states; too often efforts to achieve vital legislation are tagged—erroneously—as beneficial only to a few residents of those few states. Legislation that is beneficial to all—to the whole industry and to the nation as a whole—must be sold as such. And the people who are at the point of most intimate contact with the public must be enlisted in the fight. But before that can be done, they must be convinced of its importance to themselves and to the community they serve.

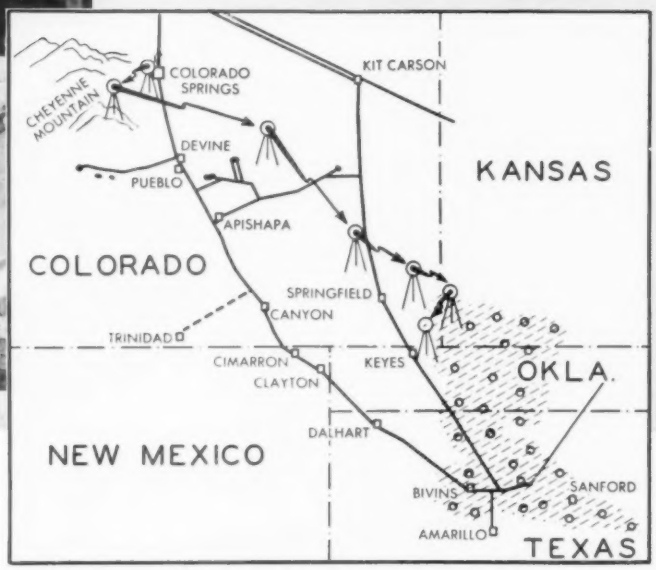
Retailers are to be found in every city, town, and hamlet in America. They have roots deep in the community. Their neighbors will pay more attention to what they say on controversies affecting oil than to all the slogans dreamed up on Madison Avenue.

All too often in the past, dealer influence has been exerted against—rather than for—the interests of the oil industry as a whole. Industry leaders must make a renewed effort to correct some of the misunderstandings as to the facts of life in the producing, refining, and transporting segments of the industry. Dealers should be shown, for example, that retail gasoline prices would be much higher except for the percentage depletion they often criticize.

IF THE DEALERS can be made a part of the team, the industry will have far less trouble when it goes to Capitol Hill in behalf of legislation it knows to be in the public interest.



***Through Mountainous Terrain, Dust Storms and Weather Extremes...***




From a point on Colorado's Cheyenne Mountain, the microwave beam is relayed over mountains and prairies alike in its 230-mile swing to gas fields in Kansas and Oklahoma.

# RCA Microwave's Dependability

## has justified Colorado Interstate Gas Co.'s choice for pipeline communications system

When Colorado Interstate engineers studied communication facilities to connect home office with pipeline compressor stations and with gas-producing fields in Kansas and Oklahoma, they considered wire line, common carrier and microwave. They chose RCA Microwave.

According to W. I. Blount, Superintendent of Dispatching and Communications, "RCA Microwave offered many advantages. It provided relatively easy maintenance, static-free operation and was economically equal to wire line or common carrier. And the more numerous the channels, the cheaper by comparison it became.

"In addition, such a microwave system made it possible to integrate into our already established VHF radio system more stations and mobile units and thus increase the efficiency and scope of our radio system. It offered almost unlimited future possibilities, such as telemetering channels, facsimile, teletype, additional voice channels, remote control of unattended stations and a service channel—all at a relatively small cost."

Only RCA MICROWAVE systems provide so many advanced engineering features. For example, single sideband suppressed-carrier frequency-division multiplex is used exclusively to meet high standards of dependability. Frequency is controlled from the terminal through the entire system.

*Microwave specialists will be glad to answer any questions and plan your installation. Mail coupon for further particulars on use of Microwave in utilities, pipelines, turnpike and other applications.*

**RCA MICROWAVE**

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**RADIO CORPORATION of AMERICA**
COMMUNICATIONS EQUIPMENT
CAMDEN, N. J.

**Radio Corporation of America**
**Communications Equipment, Dept. GB-280, Building 15-1, Camden, N. J.**

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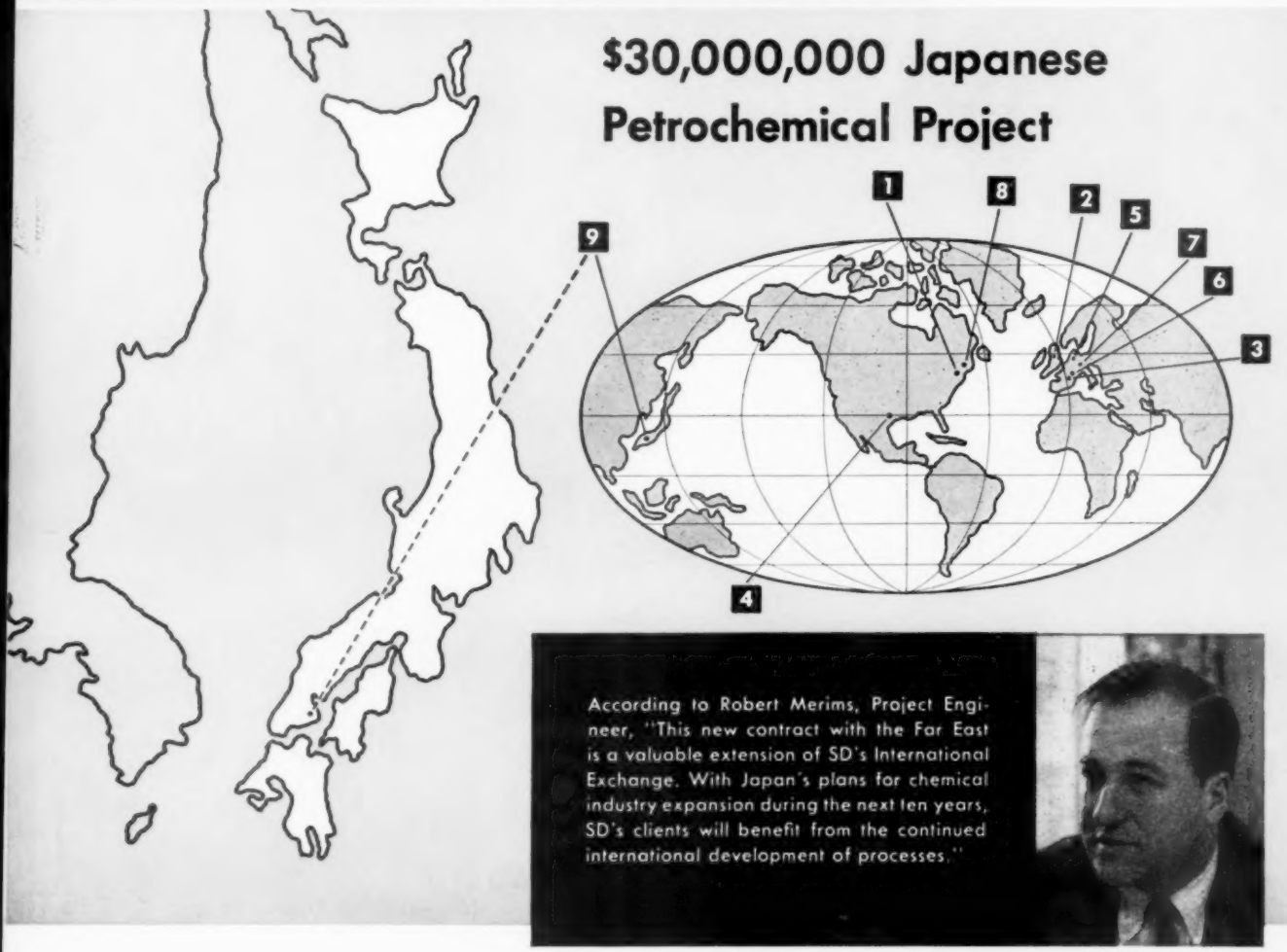
COMPANY _____

ADDRESS _____

CITY _____ ZONE _____ STATE _____

☐ Have an RCA Representative get in touch with me.

# NEW DEVELOPMENTS


$30,000,000 Japanese
Petrochemical Project
1
8
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According to Robert Merims, Project Engineer, "This new contract with the Far East is a valuable extension of SD's International Exchange. With Japan's plans for chemical industry expansion during the next ten years, SD's clients will benefit from the continued international development of processes."

# SD Has Complete Process Responsibility For Ethylene Oxide, Glycol and Cumene

In a move to regain Japan's markets in Southeast Asia, Mitsui Petrochemical Industries, Ltd., will build Japan's first major petrochemical project. Financed entirely by Japanese capital, this $30,000,000 facility will be comparable in size of investment to the largest petrochemical plants in continental Europe —among them in turn some SD clients.

Three key units in the first phase of this project, scheduled for completion in November, 1957, will utilize SD processes for these basic chemicals. Ethylene Oxide by direct air oxidation of ethylene; Cumene by alkylation of benzene with propylene; Ethylene Glycol by hydration of ethylene oxide. In addition to designing and engineering these processes, SD will also oversee construction and supervise initial operation.

The second phase of the Mitsui project, now in the planning stage, will produce dimethyl terephthalate and other chemical intermediates. A major part of this production will be used for the manufacture of synthetic textile fibres.

This is another example of how SD's "International Exchange" works. The ethylene oxide process, for instance, started in SD's American Laboratories (1); was developed in an English pilot plant (2); went on stream for the first time for Naphtachimie in France (3); shortly after was used in an American plant (4); another for Societé Chimique des Derives du Petrole in Belgium (5); an expansion of Naphtachimie (6); another European plant not yet publicly announced (7); the General Aniline and Film plant in Linden, New Jersey (8); and now across the Pacific to Japan (9).

With this project SD's cumene process takes its first trip abroad. In this country the Barrett Division of Allied Chemical & Dye Corp. is now producing cumene in its SD-engineered plant. Mitsui chose the SD process because it produces purer cumene than any other known process. And the plant may be adapted to production of other alkylates, such as ethyl benzene and diisopropyl benzenes.

Perhaps you can benefit from this worldwide experience in organic chemical plant design. Whether your project involves new plant construction, revamping existing facilities, developing a new process, acquiring an existing process or engineering one of your own, you will profit by SD's confidential service.

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